The Mining Journal

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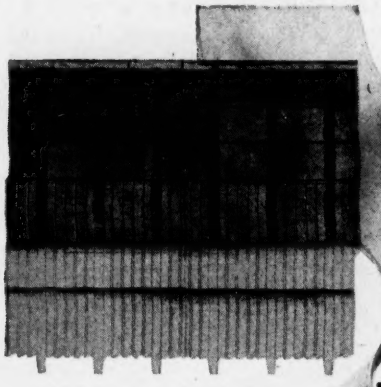

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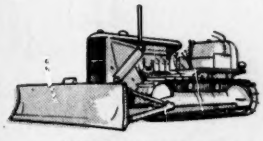

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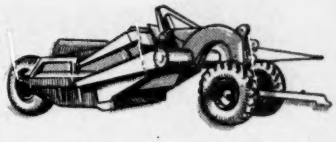

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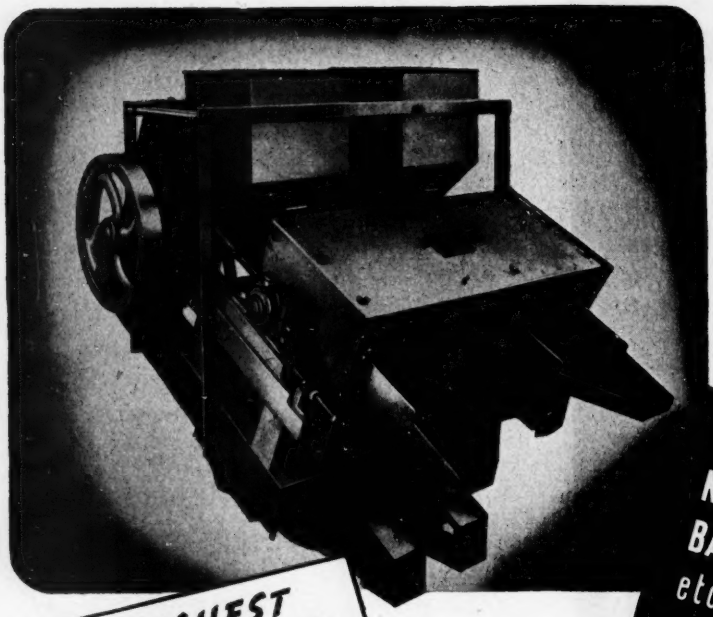

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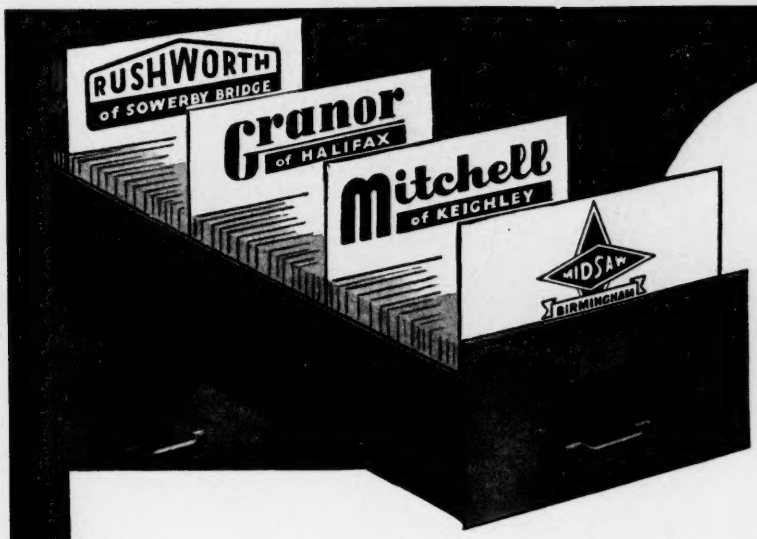

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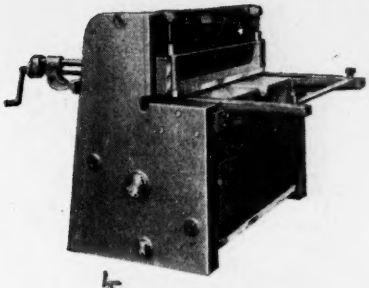

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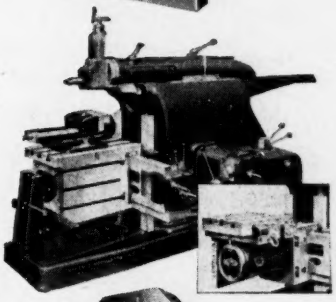

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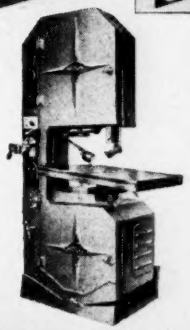

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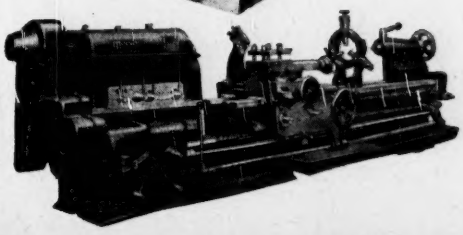

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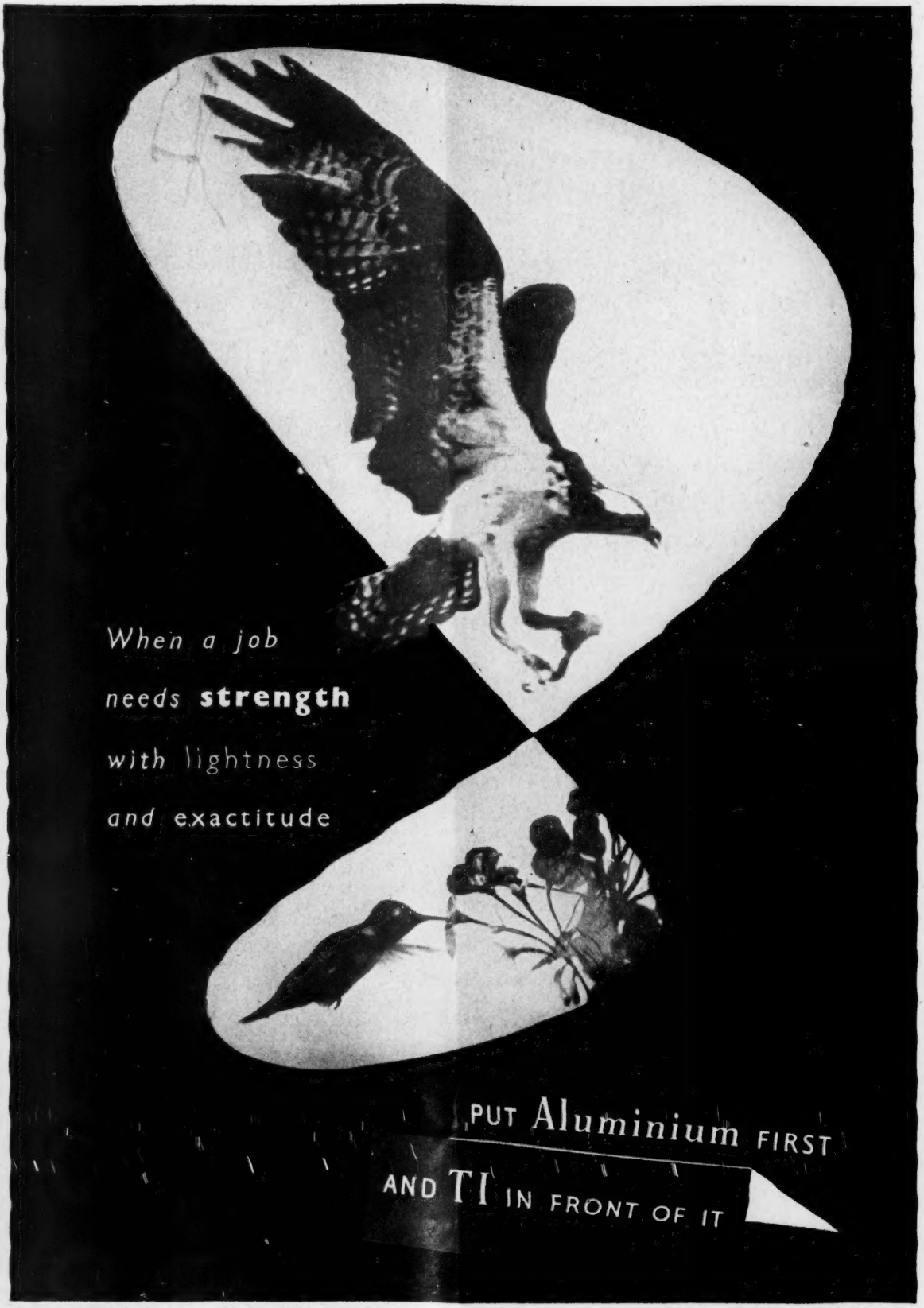

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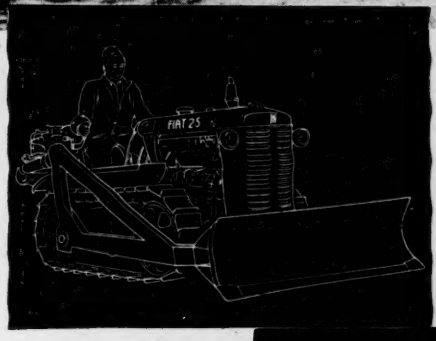

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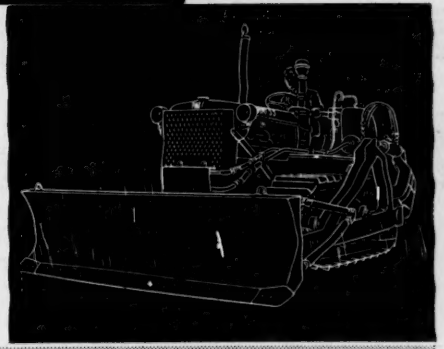

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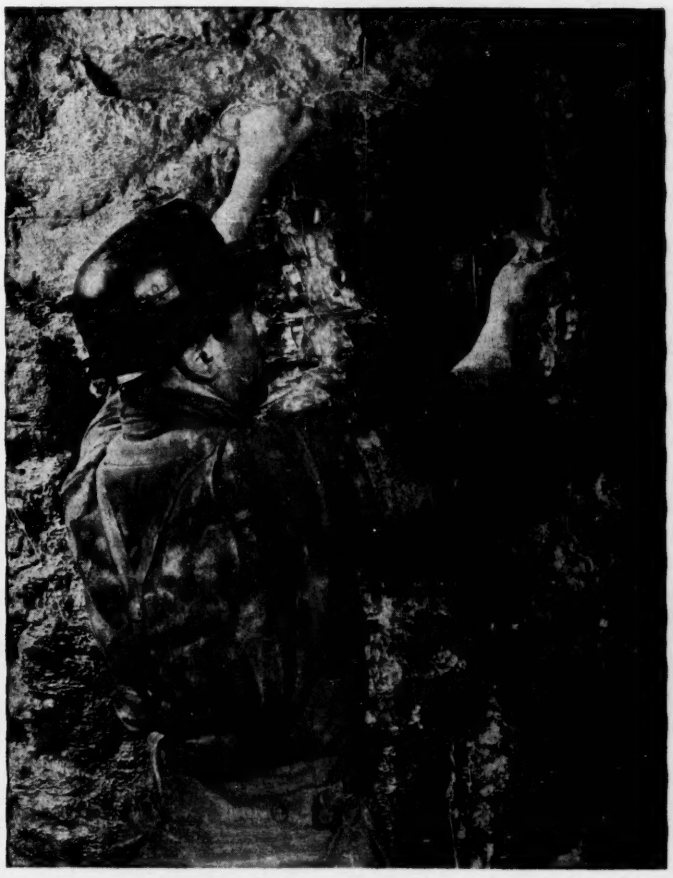

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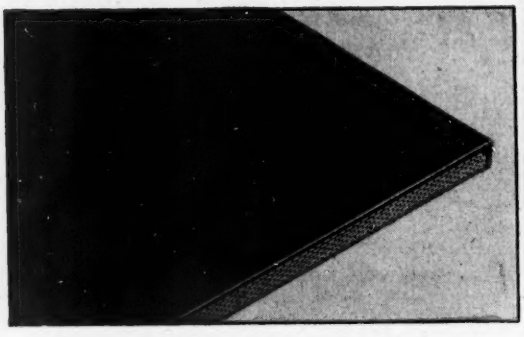

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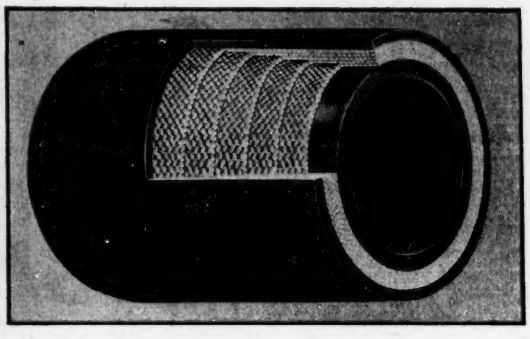

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The Mining Journal

Established 1835

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CONTENTS

Notes and Comments 181
From Our Own Correspondent 182
Brazil ; South Africa ; Canada ; Western United States.
The Declining Mexican Mining Industry 185
Central African Federation 186
French Production of Native Sulphur at Narbonne .. 188
Machinery and Equipment 190
Metals, Minerals and Alloys 191
The Mining Markets 193
Company News and Views 194
Rand & O.F.S. ; Indians ; West Africans ; Roan & Mufulira ; Petaling Tin ; Barrow Hepburn & Gale.
Company Shorts 196

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NOTES AND COMMENTS

The Outlook for Tin

President Eisenhower's order abolishing price controls on wages and salaries and over a wide list of consumer goods accompanied as it was by information that these were merely opening moves in a plan under which all prices would be decontrolled, is an important event for the future of tin. It is true that price curbs still remain but are expected to follow the fate of the controls on use and sales. It is widely thought that abrogation of control of price should assist the tin market to throw off the stalled condition which has affected it of late, and has resulted in a backwardation of £30 or more between spot and three months.

What is likely to be the effect of this lifting of controls on the volume of dealing and on price? At present we can only enumerate some of the major influences for and against an advance without presuming to forecast the future trend of prices. Among factors favouring the idea of an advance there is the belief that consumption in the United States, which was very low last year, even compared with 1951, will rapidly improve and that important consumers, like the United States Steel, will also stock up, as the government stockpile is now said to be nearly complete. Small consumers generally may also be encouraged to purchase were the big gap between spot and forward to be reduced or eliminated.

It has also been thought that the Bolivian output as the result of nationalization of the principal mines and of exports would be further constricted, and the warnings that the current Malayan output must deteriorate in the future have been (in our opinion prematurely) interpreted as a factor of production limitation. Thus far, however, they can hardly be regarded as being operative to any serious extent. While the output of the Longhorn Smelter fell to 22,541 tons last year owing to three months' strike, compared with 30,883 tons in 1951, production in the last quarter was considerably above the figures for the same period in the last three years and the announcement that an agreement had been reached by Williams Harvey to purchase some 50 per cent of the output suggests that the Bolivian production may be maintained. The information that Indonesian production last year was 35,000 tons as against 30,986 in 1951 and that the Thailand shipments had increased and that the Australian output was around 1,700 tons as against 1,459 tons in 1951 together with the prospects of improvement in the Congo output suggest that world production is by no means assured of a decline at present, and that the estimate that production is in excess of consumption by some 30,000 tons a year has still to be disproved.

Perhaps the major uncertainty is what recovery in United States consumption we ought to expect. The Bureau of Mines gave a revised estimate recently of 56,884 tons in 1951 as against 71,774 tons in 1950 while for last year the estimate is no more than 45,000 tons in 1952. It is believed that the maintenance of a controlled price in America of 121½ c. per lb. has exercised an important influence in restricting consumer buying and once this is removed more activity may well ensue. The general experience of freeing metal markets in this country has been accompanied by a decline rather than an advance, in the markets for lead and zinc. Tin, however, would have to fall very considerably if the trend towards substitution of tin by other metals, more particularly aluminium, is to be stayed. A strong effort was obviously made in America, as revealed by the Paley Report, to encourage substitution, but it is impossible to judge in this country at the moment how far the reduction in consumption last year may have been permanent. Anyhow the next few weeks should give us a better idea of how industry is going to react to the removal of controls which have certainly had their inevitable effect in producing an artificial restraint on the course of development.

A Bold Step Towards Economic Unification in Europe

A big stride towards the economic recovery of Western Europe has been taken this week by the opening of a single market embracing coal, iron ore, and scrap, throughout France, Western Germany, Belgium, Holland, Italy, and Luxembourg. Two months hence this bold and imaginative plan for the economic unification of 155,000,000 Europeans will be further extended by the inclusion of steel in the free market. Thereafter the main barriers to free trade between the six nations will be broken down, customs tariffs on iron ore and scrap will be abolished and irrespective of nationality producers throughout the area administered by the High Authority, will have unrestricted access to available mineral resources.

These are momentous changes whose profound significance is not restricted to the economic sphere. If the Schuman plan succeeds; if the six constituent nations find it possible to accept the decisions of a supra national authority, and to take concerted action for the advancement of their joint industrial interests it can scarcely be doubted that this new enterprise must help to dispel mutual suspicions and antagonisms in international relationships, and inaugurate a more hopeful era of friendly co-operation.

From this economic re-orientation the United Kingdom stands aloof but by no means indifferent. M. Monnet, the President of the European Coal and Steel Community, has made no secret of his ambition to secure the co-operation of Great Britain which is the main producer of coal and steel in Western Europe, and within limits the British Government has cordially reciprocated. As long ago as September last a British delegation with expert advisers from the coal and steel industries, was appointed to the Luxembourg headquarters of the Community and since November a joint committee of the British delegation and the Community has been actively at work upon the evolution of a plan to enlist the utmost co-operation of this country short of actual membership.

Sir Cecil Weir, head of the British delegation, is well pleased with the progress thus far achieved. He affirms that these consultations have "cleared the air" and "dissipated many of the earlier fears." If he is right the High Authority has opened the door to a new European partnership in which major political, military, and economic problems can be approached and dealt with from a common standpoint.

Canadian Metal Production in 1952

Metal production in Canada during 1952 registered an increase over the preceding year, but because of a lower price for copper, lead, and zinc, the value of the output was slightly lower. Preliminary estimates prepared by *The Mining Journal* have indicated metal production valued at close to $725,000,000 in 1952 compared with $745,500,000 in 1951. Added to this was an output of close to $260,000,000 in fuels such as petroleum, coal, and gas; a further $124,000,000 in non-metals such as asbestos, gypsum, salt, sulphur, flourspar, etc.; and a further $164,000,000 in clay products and structural materials. The combined output of minerals in Canada during 1952 had an estimated value of some $1,275,000,000 compared with $1,245,483,000 in 1951.

Gold miners produced approximately 4,420,000 oz. during the year compared with 4,392,750 oz. in 1951, but due to the American dollar being at a discount, the value received by Canadian gold producers during 1952 was $151,500,000 during 1952 compared with $161,872,000 in 1951. About the only favourable trend reported by gold producers during the year was a more satisfactory supply of labour.

Canada exported $708,000,000 worth of non-ferrous metals and their products during 1952, according to the Dominion Bureau of Statistics. Exports in this category during 1951 were valued at $570,000,000, while the 1950 total was $457,000,000.

Exports of primary non-ferrous metals last year were well above 1951, as follows, in s.tons :—Primary aluminium 412,589 (354,414), Semi-fabricated aluminium 23,617 (14,804), Refined copper 113,675 (101,831), Refined lead 129,740 (105,736), Fine nickel 77,058 (72,357), Zinc spelter 166,864 (146,132).

Among individual increases for the year, for example, Canadian exports of brass bars, rods, strips and sheets to Western Germany during 1952 increased to $1,124,000 compared with only $129,000 in 1951. In copper rods, strips and sheets, Australia took $1,931,000 worth in 1952 compared with only $30,000 worth in the preceding year.

Brazil

(From Our Own Correspondent)

Terezopolis, February 4.

Professor Mehl, of the Carnegie Institute of Technology, has submitted a report on the possibilities of the Brazilian mining industry to the Brazil-United States Commission for Economic Development. The report is compiled under three headings: (1) Natural and industrial resources; (2) Iron and steel; (3) Non-ferrous metals.

Professor Mehl emphasizes that "the vast deposits of iron ore of exceptional quality" ensure ample supplies for any possible expansion of local steel manufactures during many years, as well as for exports on a much larger scale than at present. He calls attention to the important iron ore regions of Central Minas Geraes, of Urucum, in Mato Grosso, and Ampari, in the Amapá Territory. The Department of Mineral Production and the U.S. Geological Survey are now investigating various types of ore, not yet classified.

Referring to the steel industry, the report considers the plans for expansion fully justified and recommends that it be left, as far as possible, to private initiative. Competition should be encouraged, but concentration in a few big units is preferrable to dispersal among many small ones. The major difficulties—inadequate transport and the shortage of specialized workers and of good coal for cokeing—can be overcome by skilful, firm planning.

As regards non-ferrous metals Professor Mehl states:

Manganese—Reserves exceed local needs, but the Minas Geraes deposits have been seriously depleted by large scale exports. These should in future be reserved for the national steelworks in Minas Geraes, S. Paulo and Rio. The more distant Urucum and Amapá beds can be exploited for the foreign market.

Nickel—The reserves, estimated at 400,000 tons, are ample for Brazil's needs and the known deposits should be exploited without delay. (The most important are at Sao Jose de Tocantins, Goias, where a Canadian company has acquired a mining concession.)

Tungsten—Occurs chiefly in the form of scheelite. The abundant deposits in north-east Brazil should be exhaustively examined in view of the world's growing demand.

Chromium—The known reserves exceed 500,000 tons, but other occurrences await prospecting.

TIN DEVELOPMENTS

Telegrams from the Guapore Territory announce the discovery of tin along the Rivers Jaci-parana and Cautarios, affluents of the Madeira and Guapore Rivers, respectively.

In the Amapá Territory Brazilian and American engineers, co-operating with the local government, are examining the cassiterite deposits along the Rivers Amapari and Araguari (see *The Mining Journal*, December 7, 1951).

Companhia Estanifera do Brasil has installed plant at Volta Redonda, near the National Steelworks, and will produce 3,000 tons of metallic tin annually, with 99.97 per cent elementary tin. According to the December issue of *Engenharia, Mineraco e Metalurgia*, the refinery, the largest in South America, occupies an area of 7,200 sq. metres. It has four specially built transformers, three electric resistance furnaces, with capacity for 10 tons of metal per day, and a mechanical section for complex ores. The latter consists of three electro-magnetic separators, three vibrating tables for washing, vibratory screens, crushers and calcination furnaces. Crude tin is refined by fusion in special furnaces.

Although cassiterite occurs in several Brazilian States (see *The Mining Journal*, June 30, 1950), 90 per cent of production comes from the municipality of Sao Joao del Rei, Minas Geraes.

South Africa

(From Our Own Correspondent)

Johannesburg, February 3.

The past month has been an interesting one for the South African mining world with the announcement of the first profits from uranium recovery and some most encouraging development figures from the new Free State Fields.

During the quarter ended December 31, West Rand Cons. returned a net profit of nearly £125,000 from the uranium plant which came into operation during September and was officially opened at the beginning of October by the Prime Minister. Apart from anything else, this touched off a sharemarket "boomlet" in uranium shares, which was all the more welcome in view of the bad times the Stock Exchange has been going through over the last year or so. These additional earnings brought the working profit of West Rand Cons. up from £396,000 during the September quarter to £526,000. This is all the more satisfactory when it is taken into account that the plant was not in operation for the full three months and also that during this period the usual teething troubles associated with any new plant had to be overcome.

The ore supplied to the West reduction plant and subsequently to the uranium section was drawn entirely from the Bird reef series and during the December quarter over 10,000 ft. was advanced on this horizon. An interesting feature is the extent to which the uranium content of this horizon has lowered the pay limit in terms of gold. The detailed development figures for this period show that the average value for the White reef was 194 in.-dwt. and that of the Monarch reef was 125 in.-dwt.

THE TAXATION TANGLE

The only fly in the uranium ointment at the present time is the method of taxation, which has been roundly attacked by the president of the Chamber of Mines on several occasions. It is lumped in as part and parcel of gold production and payment has to be made on the total profits. The incidence of this is shown in the West Rand Cons. report, where taxation for the third quarter of the year was estimated at £52,500 and £40,000 higher for the December period, despite a drop in capital expenditure. As Mr. C. S. McLean points out it is impossible to justify the imposition of the inequitable and differential system of gold mining taxation on a completely new industry. In due course, a proportion of the profits will have to be set aside for redemption of the loan made for the erection of the plant, but the actual repayments do not become due until full-scale production is achieved.

The revival of sharemarket interest in uranium stocks has naturally stimulated conjectures as to which other mines are to join the list in due course. So far as can be judged on the East Rand most of the properties underlain by adequate tonnages of Kimberley reef will come within the scope of the scheme, such as Sub Nigel, Marievale, East Daggas and possibly Springs. So far as the Central Rand is concerned, there are unlikely to be any, under present conditions, as the uranium content of the Main reef series is low. On the West Rand, the Bird reef is the governing factor. This holds out hope for a number of mines in this area, including Rand Leases and Cons. Main Reef. Durban Deep is underlain by the Kimberley reef, but no information is available as to whether its radioactive content is the same as that on the East Rand.

Turning to the new mines of the Far West Rand and the Free State, the Carbon leader, the Vaal reef and the Basal reef have now been correlated as one formation. It appears therefore that all the mines operating on this horizon can be counted as potential uranium producers. The only qualification at the moment is that it seems as though the uranium content of this reef is in direct proportion with the gold content, there is a point where—high up on the scale of value—uranium has been substituted by gold.

Among the non-producers now being seriously mooted as a uranium property is Ellaton G.M. which lies between Klerksdorp town and Western Reefs. It will be recalled that some startling values were obtained on the Vaal-Basal reef at extremely shallow depths—indeed the only known outcrop of this formation occurs on the property. The main shaft has just intersected the reef horizon at a depth of 770 ft., assaying 21.0 dwt. over 32.7 in. and at the same time the connection with the ventilation shaft was holed through.

The quarterly reports also brought forth the official announcements that trial runs are underway on four Free State mines—Western Holdings, President Steyn, Freddies North and Freddies South. This means that by the middle of the year there should be six actual producers in this area, and the second six months will see others starting up —including Virginia which is to open with an initial milling capacity of 75,000 tons a month instead of 50,000 as originally planned.

THE CASE FOR CONTINUOUS MINERALIZATION

The most interesting feature of the reports was the high percentage payability obtained at Freddies North and South, Western Holdings and President Steyn. There can be little doubt that development on reef at St. Helena and Welkom so far raised considerable doubts as to whether the Free State area might not be underlain by a lenticular formation similar to that on the Far East Rand, carrying high but patchy values.

Taking the results obtained at four widespread points as exemplified by these four properties over a shallow curve some 15 miles long, there is a case for the existence of continuous mineralization similar to that on the Witwatersrand proper, but with values running at a higher level.

The two Freddies results are regarded in mining circles as highly encouraging, since it was felt that these two properties might turn out to be low-grade mines, dependent for profitability on the handling of very large tonnages. The current values—Freddies North 97.4 per cent and 411 in.-dwt. and Freddies South 99.3 per cent and 450 in.-dwt—fall little short of Blyvoor at its best. If development continues even near this level in the future, the prospects of these two huge properties—the ultimate planned capacity being 150,000 tons a month—is exceedingly bright.

Steady progress is being made with recovery of the Free State Geduld No. 2 shaft, but quite naturally the engineers in charge are unwilling to say much until the job is successfully completed. In the meantime work is being pushed ahead on the rest of the mines and trial runs of the reduction plant should begin by the middle of the year.

SWAZILAND PRODUCTION IN 1952

There has been an overall increase in mineral production in Swaziland of £479,533, bringing the total to £2,388,195 which is a new record figure. The increase is almost entirely due to an increase in the average price of asbestos fibre, for the 34,769.2 tonnes produced in 1952 showed a decrease of 194.9 tonnes over the 1951 output of 34,964.1 tonnes, yet financial takings for this product increased by £483,481.

Gold production has ceased entirely, the small production of 0.58 f.oz. during the year being due to the gold return obtained during prospecting operations rather than to actual production. Production of barytes has fallen slightly owing to the reorganization of milling machinery, with a subsequent loss of production hours. Swaziland produced no silver during the year but increased production of metallic tin by 4.84 tonnes to 40.17 tonnes.

Canada

(From Our Own Correspondent)

Toronto, February 2.

The closing week of January witnessed feverish activity on the Toronto Stock Exchange, far exceeding any former period in the history of the Exchange. More than 33,000,000 shares were traded in during Tuesday, Wednesday and Thursday, with the peak for one day rising to over 12,000,000 shares The sudden burst of activity appears to have been touched off by announcements that diamond drilling and electro-magnetic surveys have resulted in the discovery of zinc-lead ore bodies of unusual size and promise in the Province of New Brunswick. From this point on, the activity spread to other issues, but more particularly toward ventures still in the gamble and highly speculative stage—still without shafts or underground development. Sound and old-established enterprises received very little interest, and it is difficult to escape the thought that a multitude of new speculators may experience a considerable measure of financial grief when the current fever subsides.

ADVANCE IN BASE METAL EXPLOITATION

There is no denying the fact that the base metal discoveries in New Brunswick are of major significance, and that the Province is going to rise to a place of increasing importance because of the newly disclosed mineral wealth. And although the frenzy of speculation which has been temporarily introduced to the Toronto Stock Exchange will inevitably leave serious wreckage in its wake, yet there will remain at least one compensating factor, namely, that a number of stock companies with properties of prospective merit will have been able to raise treasury funds with which to carry on exploration. Brunswick Mining and Smelting Company has so far accounted for the major new discoveries in New Brunswick. Situated about five miles from Brunswick Mining is New Lard "U" Island Mines with property on which an electromagnetometer survey has indicated a large anomaly, and this survey has alone been sufficient to introduce feverish speculation in this issue. Seasoned traders are advising caution, and are seemingly astonished at the extent of venture capital which has so suddenly come into action.

Gear and equipment designed to begin open-pit mining on the iron ore deposits of Quebec and Labrador is to be taken to the field this year. Shipment will be made over the first half of the railway so far completed, thence by tractors and sleighs over the tote roads in use in construction of the remaining half of the railway. The commencement of open pits during the coming summer is intended to place the deposits in shape for shipment of ore to commence in 1954. And while chief interest is centred upon the development of the known iron deposits yet there is every indication that the new transportation system into a virgin field of such great extent is going to loose a veritible army of prospectors across the hills of the wild new lands that remain as virgin now as they were before Columbus came to America.

The search for uranium shows promise of being greatly intensified during the coming summer in Canada's northwest, more particularly at Beaverlodge Lake and in the St. Mary's Channel section of Lake Athabasca in northern Saskatchewan. Surface prospecting, underground exploration by use of diamond drills, etc., during 1952 combined to reveal conditions which may give to the territory a place among the leading uranium producers of the world. Many millions of dollars have been ear-marked for the big job ahead in connection with providing equipment and material with which to undertake underground development.

Western United States

(From Our Own Correspondent)

Portland, Oregon, January 22.

After five years of preparation, Ray division of Kennecott, Arizona, is almost entirely converted from underground mining to open pit. The change was prompted largely by the fact that the mine is situated along a watercourse which in later operations made underground mining uneconomical. First step of the new programme was to divert this stream; stripping was commenced early in 1948 and actual mining was started in 1949 while stripping was still in progress, and by the end of 1952 open pit production was at the rate of 13,000 tons daily while production still continues from the underground mine at the rate of 2,000 tons. The increased production has required enlargement of power, water and treatment facilities. The new crusher plant embodies an elaborate dust control system and external sheathing of translucent plastic panels that do away with windows and provide diffused natural lighting which neutralizes the glare and heat characteristic of the summers in this desert region.

COLORADO AND IDAHO

Vanadium Corporation of America is adding 30 per cent to the capacity of its Durango plant which is employing a salt roasting and leaching operation on carnotite ores.

After being shut down since World War II Idaho Beryllium and Mica Corporation has reopened its mine in Latah County and is producing sheet and punch mica and beryl crystals. The mica (muscovite) occurs in pegmatite dikes and is mined by open cut. Surface over-burden is stripped by bulldozer, the ore is shot down and hand cobbed for the large pieces and books, and the remainder sent to a screening plant.

Giant Mascot Mines Ltd. has entered into a year's contract with Bunker Hill and Sullivan to ship its lead concentrates to the latters smelter at Kellogg in the Coeur d'Alene district. Giant Mascot operates a mine and 500-ton mill at Spillmacheen, British Columbia. Monsanto Chemical Co. has commenced operation of its elemental phosphate plant at Soda Springs and expects to be operating at capacity within 30 days. Bradley Mining Co. will resume operation of its antimony smelter at Stibnite this spring. The plant, which has been closed since last summer because of the low price of the metal, will also receive custom ores from Bolivia, Mexico and South Africa.

NEVADA AND WASHINGTON

Titanium Metals Corporation has brought production at its plant in the Boulder Dam area to 4 tons of titanium metal per day and is making improvements and adjustments to bring production to 10 tons per day.

Summit King is sinking an exploratory winze at its property north of Tonopah to determine the extent of the ore body that has been located by diamond drilling. Summit King is associated with Homestake Mining Co. in the venture. The location was chosen as the result of geological study as offering promise of containing the extensions of some of the veins that made Tonopah the leading silver mining camp of its day. If the work now under way confirms this evidence there is the likelihood of an important new district being opened up.

American Smelting and Refining Co. has the new 1,000-ton lead-zinc mill at its Van Stone mine in Stevens County in operation. Ore is mined by open pit methods and treatment is by differential flotation.

The Declining Mexican Mining Industry

"Exceptional Opportunity for British Capital"

The following article, received from a correspondent in Jalisco, Mexico, under date of January 15, points out the reasons for the continued decline in mining activity in that country. The joint opinion of the semi-official credit agency, Nacional Financiera, and the International Reconstruction and Finance Bank of Washington is that only Governmental action can check the rot. It is therefore pleasing that later reports from Mexico indicate a complete reversal of previous Governmental policy, with the apparent intention of encouraging foreign capital to enter the country.

That the resurgence of Mexico's mining industry depends entirely on the policy developed by the current administration is the joint opinion of Nacional Financiera, semi-official credit agency, and the International Reconstruction and Finance Bank of Washington. This conclusion is presented in an exhaustive study of "The Economic Structure of Mexico" by a commission of economists of both institutions.

Major reasons for the continued decline of mining activity are the lack of co-ordination within the industry and the failure to provide guarantees for investors. The discouraging current situation, where miners and investors are unprotected and subject to whims of the government, has brought about a situation where new capital does not even think of investing in the industry, while established undertakings are hard pressed to meet overhead expenses and are unable to amplify their facilities or think of establishment of new operations.

Many small undertakings which have been operating with limited funds have been forced to close down owing to lack of credits, and this has contributed to decreases recorded in mining production. The highly inadequate and burdensome transport conditions now existing, with dirt roads impassable in the rainy season and the lack of rail facilities in many zones, have also added to the general deterioration of the industry.

FACTORS NECESSARY TO IMPROVEMENT

The Mining Chamber of Mexico has been agitating for years to gain Federal aid for much needed credits, the setting up of a central regulating authority, and a big programme of highway and rail construction which could be placed at the disposal of the mining industry; as well as installation of electrical power plants in mining zones, the assurance of rapid, cheap transportation, and full official acknowledgment of the rights of mining operators and personnel. The economic study referred to reiterates the reforms which have been sought fruitlessly by the Mining Chamber for years and points out that Mexico has important ore reserves which should be exploited without limitation instead of being at a standstill as at present, and that this can only be achieved through systematic full-scale Federal aid to the industry.

Initial steps to improve the industry were taken late during the regime of ex-president Miguel Alemán. A special commission was set up to study the communications problem and plan a workable construction programme for mining roads, branching out from main Federal highways. A start has been made on the installation of power plants to facilitate the development of the industry and, at the same time, supply current to mining towns in out-of-the-way interior centres of population where life now is at the very lowest of levels. But this is not enough and a vast, intelligently planned Federal aid programme is urgently needed if Mexico's mining industry is to pull itself out of the rut.

There is the hope in mining circles that the coincidence in points of view of the Mining Chamber and the financial study may give impetus to the long-needed programme of rehabilitation on a major scale. Plans and projects are being studied by a mixed commission of the two institutions, with recommendations to be sent to the Departments of Communicatons, Economy and Treasury. If these government entities act on the proposed suggestions, then Mexico's mining industry could enter a new age of expansion. Only then will private capital, reassured by a constructive programme, start investing in new firms and for the exploitation of old abandoned properties.

The most recent move, being followed with considerable interest by the industry, are the negotiations now going on between the Mexican Government and Great Britain with the object of interesting British capital investment in Mexico, and especially in the mining industry. A British Mission headed by Brigadier General W. H. Crosland has been holding talks with Federal and financial officials, and has received assurances that Mexico is interested in having English business men invest in new businesses "subject to national laws" as well as increased imports of industrial equipment.

During talks that have been held, the British experts have been told that "certain possibilities" exist for the establishment of a payments agreement between the two countries, which would overcome the trade obstacle of a dollar shortage by liquidating balance differences every six months. England, which has not given the Latin American market the attention it deserved since the end of World War II, is now anxious to conclude trade agreements, and the idea of British capital investments to process Mexico's raw materials also is looked upon with favour. Under current legislation investment of foreign capital is permitted in a 49 to 51 per cent. ratio with national capital.

Mexican economists stress that the mining industry provides an "exceptional opportunity" for British capital. While large-scale mining operations are controlled by U.S. interests (and these incidentally are about the only solvent ones in the country), the small and medium Mexican controlled operations lack funds for mining and the construction of foundries to process their metals. To refine zinc, lead, copper and iron ore, these underfinanced enterprises now ship their metals to the foundries of larger companies in Mexico or to southern Texas, with costs prohibitive.

A CHANGE IN POLICY

Since the above report was received, the Ministry of Finance has announced in Mexico City that the new Mexican Government of President Ruiz Cortines will seek no foreign loans during its period of office. The development policy of the Cortines government is becoming increasingly evident, being apparently an attempt to obtain a better return for investments made and to increase the effort to apply Mexico's resources to improve the national standard of living. No opposition exists to the matter of foreign loans however, and it is the intention of the Government to encourage the entry of as much foreign capital as possible into the country. Such capital would be particularly welcome were it utilized to establish trade and increase production, and to increase the volume of skilled and semi-skilled labour.

This alteration in the policy of the previous Government is in keeping with the recommendations of the Mexican and American specialists referred to above.

Central African Federation

The issues at stake in the proposals for Central African Federation, now in their finally revised form, have a critical importance for the mining industry in the territories concerned, dependent as it is upon peaceful and satisfied race relations. The main outline of the federal scheme, together with the queries to which it must inevitably give rise, are contained in the following article.

The draft constitution for the Federation of Southern Rhodesia, Northern Rhodesia and Nyasaland, published as a White Paper last week, is a culmination of the many official and unofficial meetings which have taken place since 1938 to promote closer co-operation between the three territories. That so many years have passed before a final draft constitution could be hammered out acceptable to those in a position to influence and execute policy in this country and in the three territories indicates that the problems to be solved were basic and enduring.

To understand the whys and wherefores of the Federal Scheme outlined in the White Paper, it is necessary to refer briefly to certain facts and policies at present current in each of the three territories. It must, of course, be borne in mind that the present boundaries dividing them are not based on any political, physical or ethnological grounds but are purely arbitrary.

DIFFERENCES IN THE THREE TERRITORIES

Although Southern and Northern Rhodesia have a common origin in the concession granted to the British South Africa Company by Royal Charter in 1889, they have since that date developed along widely differing lines. Southern Rhodesia is the most politically and industrially advanced of the three territories. It was formally annexed in 1923 by Great Britain who granted it full self-government in domestic affairs, subject to certain provisions regarding differential legislation affecting the African. It has an area about three times the size of England and is populated by 2,000,000 Africans, 136,000 Europeans and a few thousand Asiatics. The government consists of a wholly elected Parliament of 30 Europeans presided over by a Speaker. Suffrage rests on property and other qualifications which are, in form, possessed by some 4,000 Africans but, in fact, only some 400 of these are on the electoral roll. In relation to the British Commonwealth, Southern Rhodesia is a political anomaly. It sends its Prime Minister to the Commonwealth Conference, it has full self-government, its affairs are handled by the Commonwealth Office, yet it does not possess Dominion status. In racial questions, its policy is, by and large, based on segregation. No African may own land in White areas nor work there except as a labourer for a European. Africans cannot be apprentices to skilled trades nor may they grow tobacco, the country's chief export. On the other hand, Southern Rhodesia spends more on certain services for Africans than do Northern Rhodesia and Nyasaland.

Northern Rhodesia became a British Protectorate in 1924. It is larger than its southern neighbour, being about five times the size of England though its population of 1,900,000 Africans and 45,000 Europeans is less. Political advancement lags far behind Southern Rhodesia. The legislature is partly appointed by the Governor and partly elected. Two Europeans and two Africans are nominated by the Governor to represent African interests. The European trade unions under the leadership of Mr. Roy Welensky are strongly opposed to African equality, but the Government encourages the political education of the Africans, the formation of African trade unions and imposes no agricultural colour bar.

Nyasaland, the "Cinderella" of the three has been a British protectorate since 1891 and has an area of about four-fifths the size of England but a population of 2,500,000 Africans, 5,000 Asiatics and 4,000 Europeans. Political progress has been slow. The Legislative Council has nine unofficial members made up of six Europeans, two Africans and one Indian all nominated by the Governor on the recommendation of various representative bodies. The Governor presides. In Nyasaland there are no native reserves, but overpopulation, soil erosion, and lack of capital have brought about a very low standard of living and little advance in economic development.

Two cardinal points thus emerge. Firstly, the three territories are all at different stages of constitutional development. Southern Rhodesia, apart from controlling her external affairs, is completely autonomous. Northern Rhodesia can be bracketed with Bermuda to illustrate its constitutional progress. Nyasaland has vitually no political status at all. Secondly, the disproportionate influence exercised by Europeans in relation to their numbers highlights the importance of the territories' respective policies towards non-Europeans. In this regard, the policy pursued by Southern Rhodesia is the least acceptable to the African. The policy is partly the result of personal experience, often bitter, of the African and partly the outcome of fear lest the education and political advancement of the African will mean the end of European dominance.

By way of contrast, Northern Rhodesia allows the African practically a free hand. It is, then, quite obvious, that Federation could not hope to bridge these differences in political and social development by any written constitution.

Indeed the main argument for Federation is economic and the scheme has been based on the major premise that closer political association is essential if the three territories are to develop their resources to the full. In short, the final draft constitution provides a framework within which their individual economies can be developed to the benefit of all of them, for the view is taken that individually the Territories are vulnerable. Only Southern Rhodesia has any significant secondary industry. Northern Rhodesia is very largely dependent on her copper industry, which provides over 80 per cent of her total exports. Nyasaland, an agricultural community, has to rely on her few primary products such as tea, tobacco, cotton, and cannot finance her own development unaided.

THE FEDERAL SCHEME

In the words of the White Paper, the object of the scheme is to create a strong central authority compatible with the state of political development of the three Territories and having the necessary power to co-ordinate the economic life of the area.

This is achieved by allowing the three Territories to retain a certain degree of autonomy whilst giving to the Federal Legislature exclusive power to deal with the most important economic matters. Matters, on which Federal Legislature alone will be empowered to make laws include banks and banking, control of capital issues, customs and excise, currency, coinage and legal tender, foreign trade and exchange control, transport and communications, and Federal taxation. In the matters of tax, provision will be made for Federal taxation to be centrally administered and its proceeds to be redistributed between the Federation and the three territories on a quota basis of 64 per cent for the Federation, 13 per cent for Southern Rhodesia, 17 per cent for Northern Rhodesia and 6 per cent for Nyasaland.

Matters over which the Federation and the Territories may both need to have some jurisdiction are set out in a concurrent list and include development of industries,

migration between territories, electricity, geological, topographical and cadastral surveys.

Matters which most closely affect the daily life of the African, however, remain the responsibility of the Territories. This, states the White Paper, ensures a further object of the Scheme, " namely that the Territorial Governments remain responsible for discharging their special obligations to their people, particularly in questions of land and Territorial political advancement." This provision should allay some African fears as control of the land is a subject closely affecting the African and this will be entirely outside the scope of the Federal Government.

SAFEGUARDING AFRICAN RIGHTS

This brings us to the all important question of how African rights are to be safeguarded. Here the scope for argument is limited to a comparison of the merits of the safeguards incorporated in the final draft constitution now presented as against those originally proposed.

Under the original proposals, the African Affairs Board was composed of six members—three African and three European—who were to be nominated by the Governors of each territory. The Board was to be an independent but outside body whose chief function was to examine Federal legislation on behalf of the Africans. In the latest proposals the Board, with the same powers, name and number, is to be brought inside the framework of the Federal Parliament. The three African members will be drawn from the six members of the Federal Assembly and they, together with the three European members charged with special responsibilities for African interests, will comprise the Board. Moreover, since the African members for the Federal Assembly representing Northern Rhodesia and Nyasaland will be indirectly elected they ought to be more closely associated with the Africans themselves than would have been probable under the original scheme.

The powers of the Board under the new proposals remain virtually unchanged. It still retains the power to examine proposed Federal Legislation and reserving it for the assent of the Secretary of State, if, in the Board's view, it discriminates against Africans. The chairman of the Board is to be nominated by the Governor-General of the Federation from among the six members of the Board and if the Board are equally divided on a certain issue he must use his casting vote in a manner which will keep the matter *sub judice*.

The Constitution cannot be amended easily for ten years by which time it will have been reviewed at a conference of delegates from the Federation from the three Territories and from the United Kingdom.

One important feature of the new proposals is that it is laid down that there will be no colour bar in the Federal public service.

The whole scheme is to be subjected to a referendum in Southern Rhodesia at the end of March or at the beginning of April, while it will be debated in the legislatures of Northern Rhodesia and Nyasaland.

In any event, the British Government has made it painfully clear that if the present scheme is not accepted they see no prospect of re-opening the subject in the forseeable future.

IS THE RISK WORTH TAKING

That two successive British Governments of opposing parties have persisted with the idea of Federation in the face of growing African suspicion seemingly implies that this country believes that the advantages to be gained from the proposed Federation outweigh the disadvantages of African unrest. This is, of course, the crux of the matter for should there be widespread unrest amongst the Africans, it would rebound disastrously on the mining industries of the three territories and nowhere more directly than on the copperbelt which, up to now, has enjoyed good relations with its African labour force.

Since the case for Federation in the current proposals rests on economic grounds, the gains envisaged must be substantial if the scheme is to be justified. To quote from the White Paper " development of the largely untapped resources of this potentially wealthy area demands the combined efforts of the three territories acting together." There are railways to be built, rivers to be harnessed, power to be developed, food production to be expanded and, the White Paper continues, such development requires expenditure of capital and material resources on a large scale. Only a well balanced and co-ordinated economic unit, it adds, would be able to attract the capital from outside to realize the full potentialities of all three territories. This, at least, sounds impressive.

But is it really necessary to enshroud the three territories in a complicated political arrangement in order to carry out these projects?

This poses a problem dear to the hearts of the Federalist school of thought which believes that if nations allow their interests to cross national frontiers thereby involving the derogation of a part of their sovereignty they are well on the road to political union. On the other hand, there are those who believe that no matter how entangled one nation's interests are with another, economic interests are not sufficient to bring about political union. The latter would appear to be the view adopted by H.M. Government. Incidentally, the White Paper ignores the fact that neither Northern nor Southern Rhodesia has experienced any real difficulty in raising money on the London market and nothing springs to mind arising from the proposed Federation which would place the new entity in a better position to attract capital from outside.

It is then fair to say that despite some weighty economic advantages which could be achieved under Federation the economic case cannot be considered as substantial enough to outweigh the disadvantages which would immediately become apparent should African unrest develop.

IS THERE A MORE COMPELLING REASON

That being so, there are many observers of the political scene in this country who feel that there must be another and more compelling reason for the Federation. The obvious conclusion reached here is that it is being advanced largely for the purpose of providing Southern Rhodesia with sufficient scope and substance to raise her to the status of a Dominion. This argument is attractive ; it obviates the possibility of Southern Rhodesia becoming the fifth province of the Union of South Africa and it also calls a halt to the spreading Afrikaner influence. This line of thought has been well to the fore in recent discussions, although it is open to question whether the argument is more than a stalking horse for those who would like to see Southern Rhodesia the dynamic force of a Central African Federation.

After all, if Southern Rhodesia wanted to become the fifth province of the Union it would not be too difficult for her to make that intention known, understood, and by the usual " democratic methods " proceed to be absorbed. Why this would be to her advantage has never been made clear. And while the line is currently being taken that alone she is vulnerable and cannot progress beyond a certain point except through association with the Union, a glance at the map of the world will reveal other cases where a close association with a stronger neighbour has not led to absorption.

At present Southern Rhodesia is expanding rapidly. She has, within her borders, the raw materials necessary for the development of secondary industry and it would certainly not appear out of place—after granting Ceylon Dominion status (not forgetting that Newfoundland with far less re-

sources was once a Dominion)—to grant her full Dominion status within the Commonwealth.

BRITAIN'S AFRICAN TRUSTEESHIP

But may it not be that this country has felt compelled to act because of her position as trustees for the Africans. In view of the increasing tension between the races, it has put forward a scheme—political in nature and economic in content. It has provided safeguards for African interests as adequate as any written constitution can make them. The opportunity for their political advancement, while not large at present, is there for all to see. Moreover, the removal of the colour bar in the Federal Public Service cannot be dismissed as mere lip service to the principle of partnership. For here is a real opportunity for the educated African to develop a sense of responsibility and to learn what kind of lubricant is required to oil the machinery of government.

The risks inherent in the scheme remain enormous, as open opposition to the scheme by the African will not only destroy any chance of its successful operation but, it will also destroy any opportunity for black and white to work together for their common benefit.

In conclusion it can be said with confidence that this country would never knowingly impose on the Africans anything that they would be opposed to unless it was absolutely convinced that it was acting in their best interests and that the alternative of doing nothing would lead to chaos and disaster.

In any event, and it cannot be repeated too often, the Africans have the remedy in their own hands should the scheme turn out to be to their detriment, and by the same token the Europeans who are charged with carrying out this scheme must be well aware that only by partnership with the African can European civilization continue to progress in Central Africa.

French Production of Native Sulphur at Narbonne

Owing to the shortage of sulphur supply throughout the world, the Société Languedocienne de Recherches et d'Exploitations Minières, France, has been obliged to exploit a deposit of poor quality ore at Narbonne, which is highly argillaceous and offers particular difficulties in the flotation process. The technical efforts to extract pure sulphur from this deposit during the last decade are of international interest, as they make a contribution to knowledge of improved large scale production techniques. The initial activity of the Société Languedocienne in the Narbonne area consisted entirely of systematic geological research, and once the existence of a deposit warranting commercial exploitation had been established, the secondary activity demanded the application of an economic method of treating the low grade ore produced. The following article presents a report of the Société Languedocienne's endeavours to determine a flotation process which would render the Narbonne ores of commercial interest. It is significant that although these ores are of low grade, in their natural state returning only 8 to 10 per cent sulphur content, the process developed by the Société Languedocienne produces a pure product assaying 99.5 per cent sulphur.

The primary origin of the current world shortage of sulphur is essentially due to the relatively imminent exhaustion of some of the United States deposits.

These overall and international-scale difficulties are similar to those met by France during the last war, when the country was severed from connection with the United States and Italy, its traditional suppliers.

Because of these existing circumstances, the Société Languedocienne de Recherches et D'Exploitations Minières has been obliged to exploit a poor deposit, the ore of which renders treatment particularly difficult.

Four deposits of native sulphur, at Narbonne, Apt, Manosque and Les Camoins have been known in France for some time. All are low grade ores from 8 per cent to 10 per cent sulphur content, and until the last war their exploitation was very limited. In 1941 the Société Languedocienne de Recherches de d'Exploitations Minières was formed to undertake the surveying and exploitation of Narbonne, the most important of the deposits. Conditions are particularly favourable in this area, as it is a vine producing region where there is a large consumption of sulphur for the treatment of oidium. Until then, the Narbonne plant had been mined on a limited scale by the Société des Mines de Soufre de Malvézy. The survey and research work undertaken by this company were used as a starting point for more elaborate exploitation. The deposits were discovered by Tournal in 1829. From that date until 1942 the Narbonne deposit had not been subjected to systematic geological research, and the first task of the Société was to complete a survey. Some 37 drillings totalling 3,100 metres bored length were executed and 1,200 metres of exploration levels developed. These measures resulted in the locating of an ore body large enough to warrant systematic mining.

The deposit consists of a large north-north east monoclinal of 40 to 60 metres depth. It inclines to a 10° to 15° dip to west. An overburden 10 metres deep on the eastern perimeter allows for opencast mining operations. The layer containing sulphur belongs to the tertiary period and is situated in the superior stampien oligocene floor with the sulphur generally in the form of nodules which often are very small, and in this form are microcrystalline and of whitish appearance. Secondary formation deposits, in the form of yellow crystals, are less frequently found, in the vicinity of faults or local cavities. The average grade is 8 per cent sulphur, and variable but often important quantities of bitumen are contained as a by-product.

AN ECONOMIC METHOD OF TREATMENT

The second task of the Société was to discern an economic method of treatment for the low grade Narbonne ore. The American Frash process is not applicable to the Narbonne ores, and the old Italian process which burns a portion of the sulphur in kilns to melt the remainder requires rich ores and provides only a feeble recovery. Further, the sublimation of the sulphur content as practised in Chile is an expensive process and cannot be used with low grade ores, so that the known industrial techniques were not suitable for use by the Société in its treatment of the Narbonne deposits.

During the war, the Société was therefore called upon to develop a suitable process, and during this time laboratory and industrial research of many types was undertaken. Finally, a suitable flotation process was developed and at a later date the Société perfected, on an industrial scale, a process in which the still impure flotation concentrate could be enriched to a 99.5 per cent sulphur recovery.

Opencast operations began in 1943, but the commercial enrichment process was delayed by military activity until the spring of 1945. By mixing the flotation concentrate with raw ore, the Société has been able to deliver 30 to 48 per cent sulphur, which from 1945 to 1948 helped to protect many vineyards threatened by the scarcity of imported sulphur. In January, 1949, the Société introduced production of sulphur by the process it had perfected to meet the de-

mands of industry and agriculture so that to-day the entire output can be produced in the form of pure sulphur testing 99.5 per cent.

MINING AND DRESSING

In the open pit operation employed, the ground is scraped by dragline. The dragline equipment weighs 200 tons and can excavate in excess of 5,000 tons of spoil per day. The dredge bucket is 5 cu. yd. in volume, and is set at the termination of a boom 134 ft. in length. In one operation, this

The Narbonne open cast workings

machine mines the ground and stores the spoil 230 ft. from the work face. The ground surface is broken by explosives in a preliminary operation, and the deposit, composed of argillaceous schists, chalky marls, gypsum and sulphur, is loaded to trucks and transported to the mill. Extraction operations are carried out on more than 1,500 tons of ore per day.

In the dressing process, the ore is first crushed in two jaw crushers to below 88 mm. fragmentation, and these pieces are sent to intermediate storage to ensure a continuity of operation in the treatment plant when mining operations cease temporarily. Gathered by scraper and then by a belt conveyor, the ore is milled in two hammer mills which reduce it to 15 mm. fragmentation before a hydraulic spout conveys the whole to the final milling process in three ball mills.

The flotation requires a classification of the product arriving from the ball mills, and this classification operation is carried out by a screw classifier and two rake classifiers. Rough grains are poured off in the classifier and are returned to the ball mills while the smaller grains overflow to form a suspension pulp. After dilution, this pulp is returned to the flotation centre.

FLOTATION AND REFINEMENT

The flotation process consists of an action on the grains present in the pulp. This action ensures that the sulphur rises to the surface of the liquid in a specially formed froth, leaving the gangue in suspension in the water. This selective operation is performed in cells strongly agitated by impellers which accept, simultaneously with the froth inflow, a large quantity of air which produces an important emulsion. The air bubbles formed rise to the surface and produce a froth; this becomes stable by the addition of a frothing agent.

A "collecting reagent," chosen because it only wets the sulphur grains and not the sterile grains, is also added to the pulp. The collector recovers the surface of the sulphur grains, and adheres by capillarity to the froth so that the sulphur is selectively dragged to the surface with this froth and is separated from the gangue. The gangue stays in suspension in the water.

The froth, mechanically collected at the surface of the rougher cells, forms the first concentrate, enriched at 40 to 50 per cent of sulphur content. The pulp remaining as tailings is sent to decantation pools for return to the nearby river.

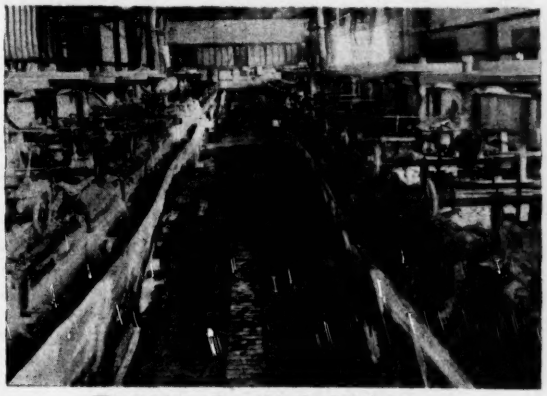
The first concentrate is then treated in cleaning cells where it is separated in a final concentrate testing 80 per cent sulphur content which is collected in the froth and middlings still containing sulphur, and which are mixed with the fresh pulp at the head of the rougher cells. The final concentrate is thickened and filtered on a rotary filter.

The Narbonne flotation plant can treat more than 1,500 tons of ore per day, and includes 40 rougher cells with a total volume of 100 $m.^3$ and 43 cleaning cells of total volume 40 $m.^3$. The importance of the plant is emphasized by the argillaceous nature of the Narbonne ore, a factor which adds considerable difficulties to the flotation process. But the Société has perfected to industrial scale a process allowing a high recovery, and this transforms the flotation concentrate to a pure sulphur assaying more than 99.5 per cent content.

In the refining of the Narbonne sulphur, the flotation concentrates are sent to steam-heated tanks where the sulphur is melted at a temperature of 120° to 130° C. and the water is simultaneously evaporated. The apparatus is specially designed to avoid froth, as this would cause overflows. The impure melted sulphur is then subjected to special treatment, allowing for the separation of the gangue particles from the bath of pure melted sulphur, and those particles of gangue still containing some sulphur are sent to the head of the flotation circuit.

ACTIVITIES OF THE SOCIÉTÉ

Industrial production of pure sulphur began in 1949, and by the beginning of 1952 the Société's production represented 10 per cent of the domestic consumption of France and it is expected that the figure will soon reach 15 per cent of French consumption. The chief products include crude sulphur for industrial uses, roll sulphur, and most important, commercial flour sulphur for agricultural purposes. Finely ground sulphur is also supplied to some industries, notably the rubber industry, and in addition the Société delivers enriched ore assaying 48 per cent for oidium treatment in the vineyards of France and North Africa.



The rougher cells used in the flotation process

It is easy to obtain good recoveries from flotation concentrates testing more than 70 per cent sulphur generally, and even 80 to 90 per cent.

The refining process of the Société, applied to such concentrates, allows the return of 99.5 per cent sulphur content with reduced cost of production. Tests applied to ores from different parts of the world show that the process is applicable and economic at an international horizon.

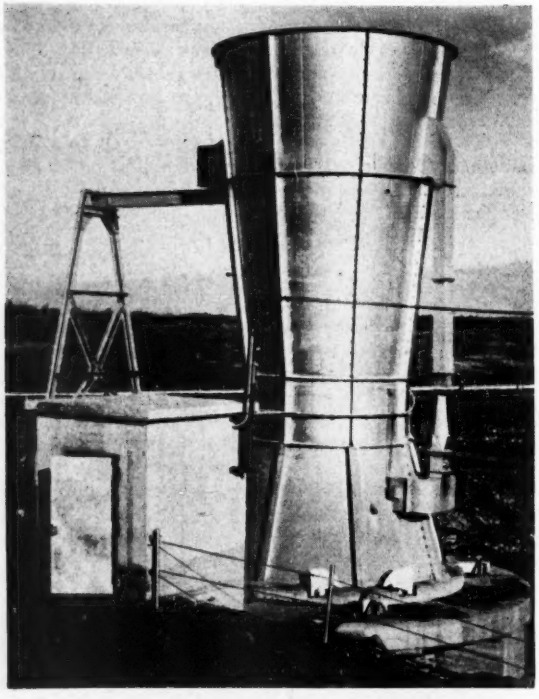
MACHINERY AND EQUIPMENT

A New Canadian Exhaust Fan

Hailed as the only unit of its type in Canada, a 20-ton exhaust fan has been installed by the International Nickel Co. of Canada Ltd. to ventilate the underground workings of the new caving project at its Creighton mine in the Sudbury district, Ontario.

This vertical fan is driven by a 350 h.p. motor weighing 5 tons, and ventilates the underground workings by means of a flow of fresh air at the rate of 300,000 cu. ft. per min. In its operation the fan draws the air from surface, passes the flow directly through the caved or broken ore, circulates it through the workings and carries it back to surface through a main return shaft. The fan itself is mounted at the top of this shaft.

The fan is set on a concrete base, and stands 42 ft. above the base. The diameter at point of inlet is 15 ft. The 124 in. impeller has 12 stainless steel blades which are adjustable in



The 20-ton exhaust fan installed at the Creighton Mine.

pitch through 25° to accommodate the load as mining operations move further from the main return air shaft.

In the caving method of mining at Inco's properties in the Sudbury area, gigantic masses of undercut ore far underground, are induced to cave and disintegrate through tension and torsion as well as by their own weight. This low-cost bulk mining method, plus metallurgical practices, make it practicable for International Nickel to recover and treat ore lower in grade than it has ever worked in underground mining. The supply of economically available ore has thus been broadened, enabling the Company to maintain its current nickel production at a post-war level. The bulk mining methods are part of Inco's long-range programme of conversion to wholly underground mining.

As the Creighton caving programme developed, primary consideration was given to devising a ventilation system which would provide for the flow of a steady stream of fresh air through the slusher drifts, or passageways through which ore is drawn off after it has come through funnel-shaped boxholes beneath the mass of broken ore. The ventilation system is effectively servicing the caving project as it has been developed to date, and has ample capacity to handle ventilation needs under maximum operating conditions.

Geared Motors for Driving Work

The Size 3 Coventry Gear Motor is produced by the Coventry Gear Company, one of the David Brown Group, and is available as either a double or triple reduction unit. These units are suitable as drives for conveyors, small compressors, pumps, hoists, dryers, strainers, fans and like equipments. They can be mounted in various positions, but are not suitable for running with the output shaft extended vertically upwards. Gears and motors are integral and thus in permanent alignment, and owing to considerations of height the units are particularly suited to operation in confined spaces.

Gears are of high tensile steel suitably heat treated and are accurately generated to give smoothness of operation, the first reduction gears being of the single helical type while the second and third reductions are by spur gears. Shafts and bearings have ample capacity for dealing with the overhung loads normally experienced, while the maximum which can be accommodated on the output shaft is equivalent to a steady tangential load of 600 lb. at a radius of 1 in. when applied midway along the shaft extension.

The case is a one-piece casting made of close-grained cast iron, bored and faced at each end to receive the end cover, motor adaptor and gear assembly. The end cover and adaptor are secured by Allen screws, and the gears are positively lubricated by the splash system. When vertical mounting is specified a screw pump is incorporated which provides a positive oil feed to the top bearing and gears.

The overall efficiency of the double reduction unit is approximately 96 per cent and that of the triple reduction unit between 94 per cent and 95 per cent. Double reduction units weigh 105 lb. excluding motor, and fitted with a 1,425 r.p.m. motor have maximum input h.p. of 3.00 to 5.00, depending on the various dimensional units. The triple reduction units weigh 110 lb. excluding motor, and equipped with 1,425 r.p.m. motor have maximum input h.p. from 1.25 to 3.00 in the various dimensional units. The power ratings are based on an operating life of 26,000 hours without sustained overload when lubricated with a recommended oil.

A High Precision Rectifier

Design changes and improvements in the range of industrial compressed air rectifiers and reducing value units produced by The Hymatic Engineering Co. Ltd., have resulted in the development of a single high precision model capable of meeting all the diverse operating conditions previously catered for by four alternative units. The maximum inlet pressure is now 200 p.s.i. The new rectifier, type R50, effectively removes both oil and water from high pressure air supplies and delivers dry clean air at controlled pressures. This prevents corrosion and undue wear in pneumatic tools, jigs and fixtures, and eliminates costly production stoppages arising from the need of frequent overhauls. Each rectifier can be used with up to three average industrial spray guns or combinations of guns and tools, consuming up to 25 c.f.m. at accurately determined pressures ranging from 20 to 180 p.s.i. The R50 provides a high separation efficiency.

Two air purification stages are provided in the rectifier. The high pressure supply, entering the unit at high velocity through a special orifice, is directed downwards in a rotating spiral which centrifugally separates many of the impurities. It then passes upwards at a slower speed through an efficient "scrubbing" medium and is finally delivered clean and dry at the reducing valve or alternatively at the high pressure outlet. Oil and moisture separation takes place in an anodized light alloy cylinder fitted with filters and a special separator element. The deposit is drained off periodically through a tap at the base. Servicing is simple.

Throughout the operation of the unit pressure loss is stated to be low, being no more than 5 to 10 p.s.i. according to flow. Maximum inlet pressure is 200 p.s.i., outlet pressure from 20 p.s.i. to within 20 p.s.i. of inlet pressure. The flow is up to 25 c.f.m. per min.

METALS, MINERALS AND ALLOYS

It is reported from Washington that in the first month of the new Republican administration, Congress has shown itself more co-operative than had been expected in many quarters with less disposition to be critical. It is, of course, traditional that the President should have a six months' honeymoon but in the present critical times it was thought that this preliminary stage would not last long. In particular Senator Taft and President Eisenhower appear to have been acting in accord and the former more favourable to tariff reduction than had been expected. The Detroit Board of Commerce is advocating that there should be a complete revision of the tariff law of 1930 with a view of substituting tariff revisions more consistent with economic facts of to-day and leading eventually perhaps to the elimination of all tariff barriers.

COPPER. — Everywhere, President Eisenhower's announcement that the control of copper prices would be removed at an early date, probably before the termination of the general control machinery at the end of April, has quickened speculation as to how prices may range thereafter. Considerable uncertainty surrounds the situation in the two main copper producing countries of the United States itself, Chile and Northern Rhodesia. In the first named country the Copper Board of the National Bank is empowered to fix prices at its own valuation which presumably is what the copper panel thinks the traffic will bear. The United States companies which provide nearly the whole of the output are said to be asking the Government for an advance in the rate for which they are paid for their copper—24½ c.—because of the constant wage demands reducing their margin of profit.

In the case of Northern Rhodesia the warning by Mr. Guillebaud of impending difficulties arising out of the Dalgleish Report, advocating the removal or modification of the colour bar, is now being canvassed. The wage awards to the African miners are said to have been welcomed by their Union and to have inspired them with fresh zest for the campaign against the colour bar. The European Mineworkers Union boycotted the Dalgleish Commission in 1948 and will, no doubt, strongly resist any extension to the natives of semi-skilled or skilled employment. Thus, the two major contributors to the world's copper production after the United States, each presents somewhat incalculable features.

The U.S. copper import duty suspension Bill has now been passed by the Senate and sent to the White House for the President's signature. U.S. domestic mine production of copper last year was slightly down at 924,000 s.tons compared with 928,330 s.tons in the previous year, according to the Bureau of Mines figures. In a year relatively free of strikes the decline is attributed principally to the mining of lower grade ore. Production from the Greater Bute project of Anaconda resulted in the production from Montana increasing by 10 per cent.

LEAD.— There is not much change to note in the lead market and in the United States demand has continued slow. There the output from domestic mines improved last year to 405,990 s.tons from 376,851 s.tons in 1951. Imports of foreign concentrates also improved to 98,276 s.tons against 75,515. Consumption for the year to the end of November last is reported to be down about 5 per cent at 1,036,174 s.tons against 1,092,174 in the same period of 1951, and in the past week this position was further reflected in current supplies not being fully absorbed by the market. The Australian output last year was approximately unchanged being estimated at 165,000 s.tons against 165,758 twelve months earlier. Lead bullion however improved to 37,800 tons against 32,155 in 1951. Mexican production is reported somewhat lower on the year, the average for the first eleven months being 20,499 tonnes compared with 21,798 tonnes in 1951.

TIN.— Talks between the Indonesian and Netherlands governments at Djakarta as to what will happen when the Billiton tin contract expires at the end of this month are said to have produced no conclusions so far. The Indonesian Nationalist Party advocates nationalization, and in spite of opposition by the Masjumi section is now reported to have changed its attitude which was originally in favour of renewing the contract. Neither Dutch nor Indonesian sections seem to have any idea of how the Billiton mines will be worked though rumours are current that the Texas smelting interests of the American Tin Processing Corporation, at present operated by the Banka Company, are anxious to take the place of the Dutch government.

The increasing interest being taken in the Brazilian tin developments which has been several times noted by our correspondent in Rio, is expanded in his despatch printed elsewhere in this issue where it is claimed that the Companhia Estanifera do Brazil has a plant which will produce 3,000 tons of high grade tin in the largest reduction works in South America. But when this plant will be in commission is not known. In connection with the Williams Harvey-Banco Minero contract for the purchase of tin, it is stated that the English smelting company has made a first payment into the Central Bank of £212,000, presumably in respect of the 800 tons of concentrates reported shipped recently.

The following are the tin-in-ore output figures for December and the full year for the principal producers:—

Country	*December 1952*	*Jan.-Dec. 1952*	*Jan.-Dec. 1951*
Belgian Congo	1,150	13,320	13,669
Bolivia†	3,918	29,032	27,783
Indonesia	3,176	35,003	30,986
Malaya	4,934	56,829	57,167
Nigeria	795	8,371	8,529
Thailand	959	9,471	9,503

†Exports for October and cumulative export totals up to October only.

ZINC.—There is little fresh to notice in zinc. While the U.S. price remains around 11½ c., futures are reported easier at 10.64 to 10.70 c. in March. Output in the U.S. was the highest since May 1952 and amounted to 81,994 s.tons. Stocks at the end of January were higher at 88,475 s.tons compared with 87,160 a month earlier. Unfilled orders were lower. Suspension of output from marginal mines continues to be reported as a result of the establishment of an 11½ c. price for the metal.

The Australian production last year is estimated at 86,000 tons against 77,010 tons in 1951. The Mexican output increased considerably; in 1952 the average for the first eleven months was 19,229 tonnes against 11,391 tonnes for the same period of 1951. German production is reported at 147,000 tonnes compared with 140,600 in 1951. Output of concentrates in the Congo is given as 43,130 tonnes of concentrated zinc bars and 172,216 tonnes of crude concentrates (52 per cent).

ALUMINIUM. — Year end statistics reveal a fairly general increase in world production of aluminium. The U.S. output of primary metal was 937,331 s.tons against 836,881 s.tons in the previous year, according to the Bureau of Mines. West Germany's output is computed as 100,462 tonnes compared with 75,134 tonnes in the previous year and only 27,338 tonnes in 1950; the Vereinigte Aluminiumwerke was responsible for 72 per cent of the output. In Austria the Ranshofen works of the Vereinigte Aluminiumwerke reported a production of 31,000 tonnes an improvement of 45 per cent on the year. Production of bauxite in Greece during the first half of last year is stated to have amounted to 180,900 tonnes about 16,000 tonnes below the figure for the previous year.

TITANIUM.— The commercial production of titanium sponge began to assert itself last year when the U.S. production was estimated by the U.S. Bureau of Mines at 1,100 s.tons as against a D.P.A. target of 22,000 s.tons by the end of 1955. Summarising developments in 1952 it is stated that the industry produced up to 5 tons of titanium daily and a start was made to raise the output to 20 tons a day. Two-ton ingots were made for the first time; continuous wide-stripped processes were realized; and reliable alloys became available in practically all standard

industrial forms. The National Lead Company at Tahawus was the chief contributor to the domestic production of ilmenite which totalled 537,000 s.tons.

GOLD.—The South African output in January was practically unchanged from the previous month at 988,391 f.oz. against 988,732 f.oz. in December. The Rand contribution was 950,910 and outside districts of the Transvaal 14,852. Production from the O.F.S. was slightly higher at 22,629 f.oz. against 22,174.

The total South African gold production showed an increase last year of 313,953 f.oz. at 11,819,602 f.oz.; that of Canada increased to approximately 4,420,000 f.oz. from 4,392,790 f.oz., a gain of 27,250 f.oz.

The Western Australian output increased by nearly 100,000 oz. to 720,366 f.oz. but this improvement was not reflected elsewhere as the total for the Commonwealth was 780,000 against 754,519 f.oz. in 1951. The Mexican output also was somewhat higher and averaged 33,889 oz. a month to the end of November against 32,181 oz. for the same period of 1951.

SILVER.—Mexican output in the first eleven months of the year is reported to have shown considerable recovery with an approximate total of 46,530,000 oz. against 39,820,000 oz. in the same period of 1951. The Australian output, however, was slightly lower, according to the Australian Bureau of Mineral Resources and amounted to 6,900,000 f.oz. against 6,978,191 f.oz. in 1951; this figure presumably does not include silver recovered from exported material.

Iron and Steel

New output records were achieved last month by the British iron and steel industry. For the first time in the history of the industry the rate of ingot production exceeded 18,000,000 tons per annum compared with a 15,250,000 ton rate in January 1952, and pig iron was produced last month at an annual rate of 11,121,000 tons which is nearly a million tons better than the figures of a year ago. Clearly this important industry has got off to a flying start. It fortifies confidence in the ability of the steel makers to attain—and possibly to exceed—their 17,500,000 ton target this year, and to overtake the pressing needs for more steel for British industry and also to give an impetus to the export trade.

In overseas markets competition is becoming keener, but one outcome of the completion of the first development plan has been to effect a substantial reduction in production costs. The U.K. steel industry is now a relatively low cost producer. British prices are below European and American levels and there is a substantial overseas demand for British steel.

First positive results of the swelling output of steel are that a balance between supply and home demand should be speedily reached, and the imports of material from U.S.A. and European sources cut to a substantially lower level. It could also mean the early abolition of the allocation scheme which nowadays has few friends and many critics.

It is claimed that rationing has tended to accentuate the evils it was intended to cure. Certainly consumers have been encouraged to resort to hoarding steel and stocks at the end of the year were unduly high. Rationing has in fact proved a cumbrous and ineffective instrument which should be abandoned at the first opportunity.

The London Metal Market

(From Our Metal Exchange Correspondent)

In the tin market the backwardation has remained around the £30 per ton mark and the amount of business transacted has sunk to a minimum, probably due to the continuing decrease in stocks of tin in official Metal Exchange warehouses which gives a feeling of insecurity to those who might be prepared to make hedge sales, and consumers show little interest. There has been no alteration in the picture in Singapore. The Eastern price on Thursday morning was equivalent to £956 per ton c.i.f. Europe.

The turnover on the lead market has been a little better and with more February metal on offer the backwardation has tended to decrease whilst the price level as a whole remained constant. Consumer demand in Europe is still poor, but in America it is understood buyers have been more active which gives a somewhat firmer undertone to the world lead price at its present level.

The weakness in the zinc market has not been fully reflected in the price as throughout the week there has been covering of a number of small short positions. Consumer demand on both sides of the Atlantic is still at a low ebb and the general undertone remains weak.

The copper price is still firm in America and most people now think that a rise in the Chilean copper price is unlikely. At the same time the Bill for extending the suspension of the U.S. import duty on copper has been sent to the President for signature and it appears that price control will not last beyond April of this year so that a general rise in the price structure in the U.S. can be foreseen although this may be lessened by the volume of scrap which is at present being held up by middlemen and others, and which will doubtless be passed on to the refiners at an early date after any rise in the market.

Closing prices and turnover for the week are given in the following table:

	February 5		*February 12*	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£974	£976	£969	£971
Three months	£948	£949	£940	£942
Settlement	£975		£970	
Week's turnover	375 tons		225 tons	
Lead				
Current month	£95½	£96	£94½	£94½
Three months	£93	£93½	£92½	£92½
Week's turnover	3,625 tons		4,650 tons	
Zinc				
Current month	£83	£83½	£81½	£81½
Three months	£83½	£83½	£81½	£81½
Week's turnover	4,900 tons		5,375 tons	

FEBRUARY 12 PRICES

COPPER

Electrolytic .. .. £285 0 0 d/d

TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £225 per ton
Crude (70%) .. .. .. £210 per ton
Ore (60% basis) .. .. .. 20s. — 22s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, £166 per ton
Bismuth (min. 5 cwt. lots) 17s. 6d. lb.
Cadmium (Empire), 14s. 4d. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £60 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) £280/£295
Osmiridium, £40 oz. nom.
Osmium, £65/£70 oz. nom.
Palladium, £7 15s./£8 10s. oz.
Platinum, £27/£33 5s.
Rhodium, £42 10s. oz.
Ruthenium, £25 oz.
Quicksilver, £70 10s./£71 ex-warehouse
Selenium, 30s./30s. 6d. nom. per lb.
Silver 74d. f.oz. spot and f'd.
Tellurium, 18s./19s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 60% 9s. 9d. lb. c.i.f.
50% 8s. 6d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 2s. per ton c.i.f.
" " (concentrates) £13 2s. per ton c.i.f.
" " Refractory £12 14s. per ton c.i.f.
Baluchistan Metallurgical .. £14 15s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26 - £27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. .. 103s. 10½d. per unit c.i.f.
Wolfram (65%) .. .. .. 330s. c.i.f. U.K. buying
" " .. .. .. 352s. 6d. Selling
Scheelite .. .. 320s. c.i.f. U.K. buying
" .. .. 342s. 6d. Selling
Tungsten Metal Powder .. .. 30s. 8d. nom. per lb. (home)
(for steel manufacture)
Ferro-tungsten .. .. .. 25/3-25/9 nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £35 13s. 9d. d/d per ton
Ferro-manganese, home .. .. £48 12s. 11d. per ton
Manganese Ore U.K. (48% - 50%) .. .. .. 6s. 1d. per unit
Brass Wire .. .. 2s. 8½d. per lb. basis
Brass Tubes, solid drawn .. 2s. 2d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The news forming the background for markets was again more cheerful this week and this affected the whole market, particularly gilt-edged. The inflow of revenue was high and represents the first real improvement over corresponding figures last year. The strength of sterling abroad was maintained and the price index of essential commodities is slowly declining. This trend is usually favourable to an industrial nation. It was also announced that Australia will relax some of her import restrictions in July this year in favour of sterling block countries.

Kaffirs began the period with a certain amount of profit-taking. This was, only to be expected following the recent sharp rise. "New time" buyers came in on Tuesday, the last day of dealing for the old account, and demand appeared for uranium producers, particularly Randfontein. Interest in Johannesburg is still centred in new potential uranium producers and definite information is expected from the Atomic Energy Board in the near future. Rumours link the names of several mines on the Far East Rand.

In the O.F.S. the Freddies Group came in for considerable attention and speculative buying. The full significance of the quarterly figures is now beginning to be appreciated by investors. The rise in price was sustained by unconfirmed reports that the good results obtained are being continued during the current period. Loraine, whose property is just to the north of Freddies, was also supported.

West Africans were rather quiet. Amalgamated Banket improved following the higher monthly profits. The excellent Ariston development and production figures which have been attracting attention during the past year have now been recognized. The board have declared a final dividend of 20 per cent making 30 per cent for the year as against 25 per cent for 1951. Preliminary figures disclose profits of £409,228 against £332,424.

Coppers had a mixed week. The quarterly results from Roan and Mufulira recorded the effect of the lengthy labour strike. Profits in both cases were down on the previous quarter by about £1,300,000. The shares showed some recovery after earlier easiness. Chartered are maintaining last year's dividend, but an additional £1,900,000 has had to be set aside for taxation. There can be little doubt that this fantastic sum can be attributed to the incidence of E.P.L. This is a good example of how U.K. registered companies operating abroad can be affected by the present scale of taxation. Esperanza improved sharply to around 5s. on hopes of good results from the coming report.

Tin shares were irregular. Beralts recovered from their lowest level and Amalgamated Tin of Nigeria were outstanding. The columbite output figures were responsible for the sharp rise. Malayan Tin attracted attention in the eastern section, favourable notice being taken of the high production figures.

Lead/zinc issues were featureless. The metal price continues slightly easier.

Manganese shares were in demand, particularly Associated Manganese of South Africa. Reports indicate that the improved position in railing ore has been maintained. The interest in asbestos shares was also sustained. Turner and Newall recorded a sharp rise to the neighbourhood of 106s. and Cape Asbestos finished below the best. These shares at one time rose to 21s. 6d. on vague rumours that some amalgamation scheme was to be arranged between them and Turner and Newall. This rumour remains unconfirmed. Consolidated Murchison were bought on hopes of good quarterly figures.

Canadians were generally easier following unsettled conditions on Wall Street, but there was renewed interest in Yukon which hardened 3d. and the new Rix Athabasca shares were also in speculative demand rising to as much as $6. Considerable progress has been reported from Canada in the development of the new iron ore deposits, and it is interesting to note that only New Brunswick has increased coal production against lower outputs from all other provinces.

FINANCE	Price Feb. 11	+ or — on week
African & European	2½	
Anglo American Corpn.	6½	+⅛
Anglo-French	19/6	—3d
Anglo Transvaal Consol.	26/3	
Central Mining (£1 shrs.)	33/1½	—7½d
Consolidated Goldfields	49/-	—1/-
Consol. Mines Selection	27/6	
East Rand Consols	3/4½	+7½d
General Mining	4⅛	+⅛
H.E. Prop.	33/9	
Henderson's Transvaal	8/6	—3d
Johannies	60/-	+6/3
Rand Mines	4½	—⅛
Rand Selection	36/3	—1/3
Strathmore Consol.	34/-	+2/-
Union Corp. (2/6 units)	32/-	—1/-
Vereeniging Estates	4	—⅛
Writs	31/10½	—7½d
West Wits	46/3	—7½d
RAND GOLD		
Blyvoors	43/3	—6d
Brakpan	15/-	—7½d
City Deep	29/4½	—1/3
Consol. Main Reef	31/3	
Crown	40/-	—7½d
Daggas	3⅜	—⅛
Doornfontein	27/3	—1/3
Durban Deep	2⅜	
E. Daggas	20/-	—1/-
E. Geduld .. (4/- units)	38/9	—1/3
E. Rand Props	3⅜	—⅛
Geduld	5⅛	—⅛
Govt. Areas	15/-	—9d
Grootvlei	27/3	—6d
Libanon	10/9	—6d
Luipaards Vlei	25/9	—3d
Marievale	22/-	—6d
Modderfontein East	20/-	
New Kleinfontein	25/-	—7½d
New Pioneer	14/-	—9d
Randfontein	33/-	+9d
Robinson Deep	11/3	—3d
Rose Deep	21/3	+3d
Simmer & Jack	6/-	—3d
S.A. Lands	31/3	—7½d
Springs	6/9	—1½d
Stilfontein	26/1½	—4½d
Sub Nigel	51/10½	—7½d
Van Dyk	9/-	—3d
Venterspost	16/6	
Vlakfontein	16/6	—1/6
Vogelstruisbult	31/9	—1/3
West Driefontein	6⅛	
W. Rand Consolidated	58/1½	+7½d
Western Reefs	46/3	—7½d
O.F.S.		
Freddies	13/-	+2/9
Freddies N.	15/1½	+2/10½
Freddies S.	14/9	+2/6
F. S. Geduld	2⅛	—⅛
Geoffries	15/9	—6d
Harmony	21/-	—3d
Loraine	9/1½	+1/3
Lydenburg Estates	10/-	
Merriespruit	6/-	
Middle Wits	15/6	—9d
Ofsits	38/9	—1/3
President Brand	19/6	—6d
President Steyn	19/6	—6d
St. Helena	14/7½	—4½d
U.F.S.C. & G.	8/6	
Virginia Ord.	13/3	
Welkom	20/6	—1/-
Western Holdings	3½	—⅛
WEST AFRICAN GOLD		
Amalgamated Banket	1/10½	+1½d
Ariston	6/9	—1½d
Ashanti	24/3	—9d
Bibiani	6/7½	—7½d
Bremang	2/4½	
G.C. Main Reef	3/10½ XD	—1½d
G.C. Selection Trust	6/10½ XD	—4½d
Konongo	2/10½	—1½d
Lyndhurst Deep	1/3	
Marlu	1/3	
Taquah & Abosso	4/-	—3d
AUSTRALIAN GOLD		
Boulder Perseverance	2/3	
Gold Mines of Kalgoorlie	11/9	—9d
Great Boulder Prop.	7/3	+3d
Lake View and Star	16/9	
Mount Morgan	19/6XD	+6d
North Kalgurli	12/6	
Sons of Gwalia	7/9	—3d
South Kalgurli	7/6	+3d
Western Mining	11/10½	+1½d
MISCELLANEOUS GOLD		
Cam and Motor	9/3	
Champion Reef	5/10½	—1½d
Falcon Mines	8/3	+3d
Globe & Phoenix	25/9	
G.F. Rhodesian	6/3	—3d
London & Rhodesian	4/10½	—3d
Motapa	1/9	
Mysore	3/-	
Nundydroog	6/-	
Ooregum	3/4½	
Oroville	11/6	
MISCELLANEOUS GOLD (contd.)		
St. John d'El Rey	28/-	+3d
Zams	34/4½	—7½d
DIAMONDS & PLATINUM		
Anglo American Inv.	4½ XD	
Casts	25/6	
Cons. Diam. of S.W.A.	4½	—⅛
De Beers Defd. Bearer	71/6	—9d
De Beers Pfd. Bearer	14½	—⅛
Pots Platinum	10/-	
Watervaal	16/9	—3d
COPPER		
Chartered	59/9	+1/9
Esperanza	4/10½	+1/3
Indian Copper	4/7½	
Messina	4⅝	+⅛
Nchanga	6⅜	+⅛
Rhod. Anglo-American	52/-	+3d
Rhod. Katanga	11/6	+6d
Rhodesian Selection	15/7½	+3d
Rhokana	20	
Rio Tinto	24½	—⅛
Roan Antelope	14/-	+3d
Selection Trust	38/9	
Tanks	63/3	+9d
Tharsis Sulphur Br.	41/3	
TIN (Eastern)		
Ayer Hitam	27/6	—1/-
Bangrin	7/7½	—1½d
Gopeng	11/-	
Hongkong	8/6	+3d
Ipoh	18/9	—9d
Kamunting	11/3XD	—1/-
Kepong Dredging	6/6	+6d
Kinta Tin Mines	14/-	
Malayan Dredging	25/-	
Pahang	15/1½	—4½d
Pengkalen	10/3	
Petaling	13/9	—4½d
Rambutan	13/-	
Siamese Tin	22/3	—6d
Southern Kinta	15/7½	—3d
S. Malayan	26/-	—3d
S. Tronoh	12/-	
Sungei Kinta	19/-	
Tekka Taiping	8/6	+1½d
Tronoh	23/9	—6d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	12/-	+1/9
Beralt Tin	27/7½	—7½d
Bisichi	4/10½	—1½d
British Tin Inv.	14/10½	—1½d
Ex-Lands Nigeria	4/7½	+1½d
TIN (Nigerian and Miscellaneous contd.)		
Geevor Tin	14/7½	—1½d
Gold & Base Metal	3/4½	+3d
Jantar Nigeria	13/3	+7½d
Jos Tin Area	10/6	+3d
Kaduna Prospectors	3/3	
Kaduna Syndicate	3/9	+1½d
London Tin	5/6	
United Tin	3/-	+6d
SILVER, LEAD, ZINC		
Broken Hill South	45/7½	
Burma Mines	1/10½	—1½d
Consol. Zinc	27/9	
Lake George	14/9	
Mount Isa	38/6	
New Broken Hill	22/6	
North Broken Hill	58/1½	—7½d
Rhodesian Broken Hill	14/-	+1½d
San Francisco Mines	25/3	+4½d
Uruwira	3/10½	
MISCELLANEOUS		
BASE METALS & COAL		
Amal. Collieries of S.A.	45/6	
Associated Manganese	53/9	+4/6
Cape Asbestos	21/-	+3d
C.P. Manganese	53/9	+3d
Consol. Murchison	35/-	+2/3
Mashaba	8d	
Natal Navigation	3½	
Rhod. Montelco	10/6	—1½d
Turner & Newall	105/-	+3d
Wankie	15/1½	—3d
Witbank Colliery	60/-	+3/9
CANADIAN MINES		
Dome	$35½	—1
Hollinger	$29½	—½
Hudson Bay Mining	$105	—3
International Nickel	$79½	—1½
Mining Corpn. of Canada	£4½	
Noranda	$142	—4
Quemont	£6½	—½
Yukon	4/7½	+1½d
OIL		
Anglo-Iranian	5⅜	—⅛
Apex	41/3	
Attock	25/6	—9d
Burmah	43/6	—3d
Canadian Eagle	31/9	+3d
Mexican Eagle	20/-	—4½d
Shell (bearer)	80/-	—7½d
Trinidad Leasehold	26/9	—3d
T.P.D.	24/6	—6d
Ultramar	25/-	—4½d

COMPANY NEWS AND VIEWS

Rand and O.F.S. Returns for January

The majority of the Rand and O.F.S. gold mining companies complete their financial year in December. Accordingly, we have altered the form of our usual monthly output table so that the January figures are compared with results for the previous month and for the last complete financial year, instead of giving the cumulative figures to date—which, of course, would be the same for those companies whose year ends in December. The usual form in which the table is presented will appear with the monthly figures for February.

The Rand and O.F.S. gold-mining returns for January were not particularly encouraging. Profits, in general, were lower although there were some very good results scattered throughout the list. One reason for the lowered profits was the fact that the January gold price was based on a figure of 247s. 4d. per ounce compared with 248s. for December and against the peak gold price of 249s. 10d. reached last September. The current price is the lowest adopted since it was agreed to allow for fluctuations in the sterling-dollar exchange rate in arriving at a valuation basis for the monthly outputs.

Broadly speaking, producers in the Gold Fields group made the best showing. This was accomplished in spite of the fact that the group has decided to adopt as from January a standard 26-day month in calculating the monthly returns of the companies in the group. February however will cover 25 days. This has meant that the January returns now under notice are the result of 26 working days rather than 27 days which would have applied under the old system.

Company	*January, 1953* Tons (000)	Yield (oz.)	Profit (£000)	*December, 1952* Tons (000)	Yield (oz.)	Profit (£000)	Yr. ends	*Last Complete Financial Year* Tons (000)	Yield (oz.)	Profit (£0 0)
Gold Fields										
Libanon	79	15,802	39·8	82	16,319	40	J	955	181,966	433
Lupaards V.	103	19,268	47·7	99	18,550	41	J	1189	221,604	615
Rietfontein	25	5,723	24·9	27	5,991	26	D	323	72,087	328
Robinson	97	17,988	12·0	100	18,810	11	D	1331	223,246	145
Simmer J.	124	19,835	12·5	124	19,963	13	D	1486	237,450	191
Sub Nigel	66	22,643	111·8	66	22,710	110	J	794	277,350	1502
Ventersport	103	24,205	64·7	93	23,018	51	J	1180	260,650	727
Vlakfontein	36	13,231	71·4	36	13,323	73	D	445	165,123	940
Vogels	92	23,327	93·4	93	24,064	98	D	990	257,682	1017
West Drie	34	23,803	190·2	30	20,853	164	J	115	49,194	232
Anglo-American*										
Brakpan	116	20,712	24·6	122	21,569	31	D	1419	255,037	421
Daggafontein	228	53,913	363·0	231	54,655	370	D	2787	663,047	4646
E. Daggas	89	15,552	51·0	91	15,928	54	D	1140	202,694	732
S. A. Lands	105	18,955	60·0	106	18,979	60	D	1316	237,007	819
Springs Mine	152	20,993	16·1	155	21,275	17	D	1954	258,741	225
Welkom	55	10,684	14·5	56	10,670	14	D	606	106,118	L 15
W. Reefs & Ex.	109	22,529	86·1	110	22,863	92	D	1344	280,302	1214
Central Mining										
Blyvoor	98	59,125	482·1	100	60,294	506	J	1298	819,176	7327
City Deep	158	31,382	24·6	158	32,008	30	D	1851	375,759	312
Consol M.R.	167	24,421	19·4	176	24,695	22	J	2283	312,352	501
Crown	263	42,799	40·0	261	42,027	41	D	3253	518,164	476
D. Roodepoort	183	31,214	84·7	172	30,461	80	D	2168	374,333	1007
E. Rand P.	192	41,765	113·0	191	42,108	116	D	2451	528,652	1695
Modder B.	54	6,098	3·7	54	6,027	4	D	675	74,517	72
Modder E.	118	13,459	20·0	116	13,167	21	J	1409	165,656	350
Rose Deep	75	10,771	6·0	74	10,923	6	D	983	137,705	113
Welgedacht	35	4,379	4·7	32	4,048	4	J	405	47,758	49
J.C.I.*										
East Champ	26	4,159	5·0	26	4,460	8	D	355	55,026	99
Govt. G.M.A.	255	33,263	60·1	250	33,020	60	D	2943	387,698	625
New State	42	5,936	1·0	45	6,115	1	D	543	75,125	12
Randfontein	312	41,254	30·2	305	38,950	30	D	4127	494,887	356
Wit Gold	60	6,969	1·5	59	7,014	2	D	717	85,347	29
Union										
East Geduld	138	41,402	308·1	138	41,403	311	D	1725	517,545	4073
Geduld Prop.	103	15,467	31·6	102	14,900	30	D	1253	181,923	410
Grootvlei	185	39,769	239·5	190	41,130	257	D	2316	501,670	3200
Marievale	60	14,900	66·7	58	14,504	68	D	723	181,248	843
St. Helena	60	11,945	16·0	58	11,504	14	D	598	118,493	86
Van Dyk	95	15,188	6·1	95	15,072	8	D	1246	183,648	139
General Mining*										
S. Roodepoort	28	6,430	24·3	27	6,198	22	J	324	70,575	270
W. Rand Con.	230	32,663	110·1	232	33,254	120	D	2624	399,839	1490
Anglo-Transvaal*										
N. Klerksdorp	11	1,318	1·0	11	1,378	1	D	136	15,598	12
Rand Leases	158	27,614	31·9	164	27,996	35	J	2218	372,157	952
Village M. R.	34	5,338	14·0	34	5,286	14	J	409	63,619	205
Others										
N. Kleinfont'n.	109	13,996	30·0	110	14,085	29	D	1292	168,074	670
Spaarwater	11	2,381	L 2·8	11	2,385	L 3	D	126	27,545	L 29
Stilfontein	58	15,131	66·2	57	14,402	61	D	294	64,670	137
W. Nigel	17	—	7·5	17	—	8	J	135	—	13

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicate a loss.

Luipaards Vlei, Venterspost and West Driefontein, all in the Gold Fields, all announced improved results. Luipaards Vlei put 4,000 tons more through the mill, lowered its costs and recorded an advance of nearly £7,000 compared with December. Venterspost is rapidly getting back into its stride and by increasing the amount of ore sent to the mill by 10,000 tons was able to announce a decline in working costs by as much as 4s. 9d. and register a profit increase for the month of nearly £14,000.

West Driefontein continued to make excellent progress and both the tonnage milled and the profits announced were peak figures since it came into production in February 1951.

Of the other three new producers, St. Helena, Welkom and Stilfontein, the tonnage crushed by St. Helena reached the creditable figure of 60,000 tons, costs declined by 6d. per ton to 43s. 11d. and profits advanced to a new high of £16,032. Welkom, on the other hand, showed a small decline in tonnage milled while costs rose 2d. per ton to 42s. 5d. But gold production was slightly higher as was the working profit.

Stilfontein made a better showing all round save that costs increased by 3d. per ton to 41s. 9d. However, the profit figure of £66,234 was the best result to date.

Indians begin current year

The January production returns from the four Kolar Gold Field companies continue to follow the same pattern as in the preceding twelve months.

Company	*January 1953* Tons (000)	Yield (oz.)	Months since year end	*Current Financial Year Total to date* Tons (000)	Yield (oz.)	*Last Financial Year Total to Date* Tons (000)	Yield (oz.)
Champion Reef	11	3,791	1	11	3,791	13	5,685
Mysore	16	6,252	1	16	6,252	16	5,386
Nundydroog*	22	5,985	1	22	5,985	20	4,739
Ooregum	11	2,388	1	11	2,388	9	2,159

* includes tailings.

Of the four producers, only Champion Reef failed to improve on its figures for the corresponding month in the preceding year. This company was also the only one whose 1952 results came out lower than in 1951. Since November 1952, its monthly returns have fallen away sharply. The latest figures reveal a decline of over 2,000 tons milled and a drop of nearly 1,900 oz. compared with January 1951.

Mysore and Nundydroog, as usual, showed the largest advances in tonnage crushed and in gold produced. Neither return is in the record class but the big improvement over January 1952 gives them a good start for their current year.

Tonnage crushed by Oregum is well above average but the lower grade of ore crushed accounted for the relatively small yield.

West Africans made good progress

The January mine returns from the West African gold producers were, in general, good. In particular, the announcements from Taquah and Abosso, Ashanti and Bremang were very encouraging.

Taquah and Abosso for the first seven months of its current financial year ending March 31, registered working losses which by October last amounted to approximately £51,000. Since November, however, progress has been rapid and the current profit figure of £12,319 reduces its working loss for the year, before providing for depreciation, to approximately £26,000. Actually, the 25,000 tons milled in January is the highest crushing figure announced in the last three years, while the profit figure has not been bettered since March 1951. Since November last, working costs have only taken into account the actual expenditure on development rather than as previously when costs bore a redemption charge of 5s. per ton.

Ashanti, for the third successive month produced 15,000 oz. But while its production return for January is satisfactory enough, comment is reserved for the development results announced on No. 35 level—the deepest level of the mine. Here a crosscut, driving north-east, exposed ore on the Main Reef averaging 53.2 dwt. per ton over a width of 15 feet. This is the kind of result which had it been announced from a mine on the Rand or in the O.F.S., would have caused a spectacular leap

Company	January, 1953 Tons (000)	Yield (oz.)	Profit* (£000)	Months since year end	Current Financial Year Total to date Tons (000)	Yield (oz.)	Profit* (£000)	Last Financial Year Total to date Tons (000)	Yield (oz.)	Profit* (£000)
A.B.A.	62	9,432	21.5	4	236	36,893	86	206	34,908	101
Ariston Gold.	30	9,962	47.5	4	119	40,936	207	112	38,547	191
Ashanti	22	15,000	79.3	4	89	59,500	307	77	60 578	329
Bibiani (1927)	30	6,048	13.0	4	122	24,144	47	120	24,092	61
Bremang†	596	2,736	5.4	1	596	2,736	5	463	2,326	3
G.C.M.R.	9	3,601	12.8	7	60	22,920	72	60	21,668	77
Konongo	2	2,264	10.5	4	9	8,885	41	9	8,752	39
Marlu Gold	41	4,114	14.5	4	164	16,031	46	167	15,349	46
Taquah and Abosso	25	5,882	12.3	10	123	52,281	L27	210	49,823	6

*Including premium revenue since November, 1951. As the basis of calculating monthly profit varies from company to company a direct comparison one with another is not possible. The basis for any one company has, however, remained consistent, unless otherwise indicated.
†Ore treated given in cu. yd. L indicates a loss.

in the share price. As it is these very-good-indeed results coming from Ashanti have tended to accustom the investor to expecting results well above average with the result that they do not always receive the attention they deserve. In this particular instance, there is some cause for a "wait and see" attitude as the 35 level cannot be stoped until the Eaton-Turner shaft, which will serve the north end of the mine at its deepest levels, becomes available.

Be that as it may, now that "West Africans" are returning to favour with the investing public. The excellent results recently announced by Ashanti should be borne in mind for they augur well for the future opening up of the mine at depth.

Bremang is the third company singled out for comment. It has announced a profit of £10,310 compared with a loss in December of £5,397. This loss was due to its No. 3 dredge being shut down for an overhaul and to its No. 4 dredge running through low grade ground. From the January return it would appear that No. 4 dredge is still running through low grade ground but the fact that No. 3 dredge is now in full working order has enabled this adverse feature to be effectively countered. The results as the table shows are an improvement over the figures for January 1952.

Of the other producers, Konongo maintained steady progress and the four months total is slightly up over last year. Ariston did not break any more records but continued to earn good profit.

Roan and Mufulira profits fall in December quarter

The effect of the three week strike of the African labour force on the Copperbelt in October/November last had a severe effect on production and profits of Mufulira Copper Mines and Roan Antelope Copper Mines during the December quarter.

Production of new copper at Mufulira during the quarter fell by 8,186 tons to 14,738 tons, while output of blister copper at Roan suffered a decline of 6,839 tons to 15,499 tons. Naturally this made an enormous difference to their respective revenues and declines in both cases were substantial. Mulfulira's profit, before tax, contracted by £1,426,000 to £1,654,000 and Roan's before tax, was reduced by £1,362,000 to £1,724,000.

Although the profit reductions were, in both cases, appreciable it is worth pointing out that for the first six months of the current year both companies are still well ahead of the corresponding period of the preceding year. For the first six months of the current year Mufulira's profits, before tax, total £4,810,000 against £4,232,000 and those of Roan amount to £4,734,000 compared with £4,300,000 in the corrsponding six months of the preceding year.

While the labour situation has been stabilized by the recent arbitration award, coal supplies continue precarious owing to the shortage of transport between Wankie and the mines. Inadequate transport facilities have proved to be costly for the mines ere now but before any major shut-down occurs through lack of fuel everything that can be done to effect delivery will be done as the copper industry provides the Northern Rhodesian Exchequer with a very high percentage of its total revenue per annum. One thing certain is that the companies will have to bear a heavier wages bill in future as a result of the wages award which was estimated to cost the industry, in a full year, about £750,000. Nevertheless, the price of copper is still high and all signs point to its remaining at its present level. Thus given reasonable luck with coal supplies and transport facilities, prospects for the current year remain undimmed by the December quarter's poor results.

Results for the four quarters of 1952 were:—

Mufulira	March Qtr. 1952	June Qtr. 1952	Sept. Qtr. 1952	Dec. Qtr. 1952
Sales ..... l.tons	9,499	28,424	21,961	14,201
	(£000)	(£000)	(£000)	(£000)
Revenue	1,982	5,931	5,309	3,388
Costs	1,147	2,302	1,765	1,995
Difference in value of copper stocks	Cr.198	Dr.175	Dr.227	Cr.502
Surplus	1,033	3,454	3,317	1,895
London expenses	16	2	Cr.13	Cr.9
Replacements*	250	250	250	250
Profit before taxation†	767	3,202	3,080	1,654

Roan Antelope	March Qtr. 1952	June Qtr. 1952	Sept. Qtr. 1952	Dec. Qtr. 1952
Sales ..... l.tons	18,185	21,691	22,338	15,499
	(£000)	(£000)	(£000)	(£000)
Revenue	3,795	4,526	5,400	3,699
Costs	1,672	2,002	2,236	1,890
Difference in value of copper stocks	Cr.36	Cr.24	Cr.178	Cr.164
Surplus	2,159	2,548	3,342	1,973
London expenses	37	Cr.4	6	Cr.1
Replacements*	250	250	250	250
Profit before taxation†	1,872	2,302	3,086	1,724

* Subject to revision when year's accounts considered.
† Estimated.

Petaling Tin pays 105 per cent.

Petaling Tin, the important Malayan incorporated tin producer, announced a drop in mining revenue of £286,547 to £727,056 in a preliminary statement covering operations for the year to October 31 last. This contraction in profits was reflected in the total dividend distribution which was cut back to 105 per cent from 150 per cent paid in the preceding year.

Year to Oct. 31	Mining Revenue £	Costs* and Tax £	Net Profit £	Dividend %	To Reserves £	Carry Forward £
1952	727,056	307,702	419,354	105	58,333	91,756
1951	1,013,603	367,723	645,880	150	116,667	109,222

* Costs include plant replacement, depreciation and property redemption and other debits less credits. Taxation was £233,548 (1951—£259,000).

The general manager's report stated that "during the current year lower returns are expected from No. 3 dredge, but Nos. 5 and 6 degrees will continue operating in the Puchong Area in ground of good average value, and it should be possible for the standard of last year's output to be maintained." Output for the first quarter of the current year was 588 tons which compares with 524 tons in the corresponding period of the year under review. The company's issued capital is $4,400,000 in $1 shares. Meeting, Ipoh, Perak, March 4.

Barrow Hepburn and Gale maintain dividend on lower profits

Although profits of Barrow Hepburn and Gale during 1952 fell by as much as £517,744 to £144,495, before taxation and depreciation, the company is maintaining its total dividend distribution at 25 per cent on the 5s shares forming its Ordinary issued capital of £400,000 and is also repeating payment of 3 per cent on its £900,000 issued capital in £1 preference shares.

Profits for 1952 amounted to £144,495 (£662,239) to which was added capital profit on buildings of nil (£53,174), tax reserves no longer required of £40,412 (£50,000), and an appropriation from stock valuation reserve of £150,000 (nil) making a total of £334,907 (£765,413). From this amount was deducted £101,250 (£96,972) for depreciation, £88,981 (£316,288) for taxation, £25,518 (£60,349) for additional depreciation, nil (£60,712) for goodwill and formation expenses of new subsidiaries, leaving a net profit of only £49,158 compared with £128,323 in 1951.

The dividend distribution absorbed £95,025 (same) and the carry forward at the financial year-end was £301,712 (£347,579).

The accounts will be issued on February 25. Meeting, London, March 20. Mr. G. W. Odey is chairman.

Company Shorts

Chartered again pay 40 per cent.—The preliminary statement of the British South Africa Company ("Chartered") in respect of operations for the year ended September 30 last showed a net profit of £2,674,776 compared with £2,723,209 in the previous year, a decrease of £48,433. But this net figure was struck after charging £5,635,154, or £1,900,025 more than last time for taxation liabilities.

The total dividend distribution was maintained at 40 per cent, or 6s. per 15s. unit comprising the £6,570,376 issued capital. This dividend, the preliminary statement announces will be paid on April 4 to all members registered on March 6. The net U.K. rate of income tax is 5s. 9d. in the £. Meeting, London, March 26.

Tanganyika Diamond and Gold Development Incur Small Loss.—This company's principle assets are its holdings of 1,723,668 shares in South and Central African Gold Mines, and 3,648 shares in Alamasi Ltd. During the year to Sepember 30 last no dividends were received and the only revenue was from loan interest amounting to £3,353 (£2,870). But after providing for all outgoings a loss of £2,886 was incurred leaving the carry forward at £12,792 against £15,679 brought in. Mr. R. J. Donaldson is chairman.

Central South African Lands & Mines Maintains Dividend.—The principle mining asset of this company is its holding of 83.4 per cent of the issued capital of Afrikander Lease Ltd., which operates the expanding Afrikander Mine.

During the year to June 30 last Central South African Lands & Mines showed a net profit, after providing for all charges including £10,477 (£7,873) for taxation, of £80,023 against £37,668. The dividend distribution was maintained at 15 per cent which required £27,362 and after allocating £50,000 (nil), to investment reserve the carry forward was £46,741 against £53,702 brought in. Mr. G. Mackenzie is chairman.

Molyneux Gold Dredging May Soon Wind-Up.—The report and acounts of Molyneux Gold Dredging for the year to March 31 last showed that a loss of £838 was incurred on the year's operations compared with a loss of £1,153 previously. Although the company has made continued efforts to sell its dredge, as yet, no purchaser has been found. The quick alternative open to the company is to sell the dredge for its scrap value, or, at least, by dismantling it sell those parts as may be readily saleable. Mr. A. Hedley Williams is chairman.

These people write from Aracaju

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Russo-Asiatic Make Small Profit.—The report and accounts of Russo-Asiatic Consolidated for the year to September 30 last reveals that profit for the year amounted to £209 (£332) and that the credit standing to the profit and loss account at the financial year-end was £4,602. The company's interests in Russia are still valued in the accounts at £2,759,619 but, as usual, there is nothing fresh to report regarding this claim except that the Foreign Office have not abandoned the company's right to seek compensation. The annual meeting—a purely formal affair—was held in London on December 30. Mr. Edward P. Andreae is chairman.

Messina Transvaal Development Company Ltd. is to spend £20,000 on prospecting for coal in the Fort Victoria area under an exclusive prospecting order issued by the Southern Rhodesian Government which will be valid until November 16, 1955.

Mond Nickel Fellowships. — The Mond Nickel Fellowships Committee now invites applications for Fellowships of an approximate value of £900 to £1,200 for 1953. Fellowships will be awarded to selected candidates of British nationality with degree or equivalent qualifications to enable them to obtain wider experience and additional training in industrial establishments, at home or abroad, to make them more suitable for future employment in senior technical and administrative positions in British Metallurgical Industries. Each Fellowship will cover one full working year. Applicants will be required to state details of the programme they wish to carry out. Particulars and forms of application are available from: The Secretary, Mond Nickel Fellowships Committee, 4 Grosvenor Gardens, London, S.W.1. Completed application forms are required by June 1, 1953.

Mr. D. A. Thompson, O.B.E., has succeeded Mr. S. H. Boileau as chairman of the group of chrome and manganese companies which comprise The African Manganese Company Ltd., The African Chrome Mines Ltd., Baluchistan Chrome Company Ltd., The Chrome Company Ltd., Minerals Research Syndicate Ltd., and Rhodesia Chrome Mines Ltd. Mr. Boileau retains his association with the group as honorary chairman of each of the above companies.

Obituary

STEWART POWER TRENCH

We regret to learn of the sudden death on February 5 last of another senior member of the Trench family which, in addition to the metal broking firm of C. S. Trench and Co. also controls the *American Metal Market*. Mr. Stewart P. Trench was born in New Jersey in 1894 and entered the metal broking company in 1912. At the outbreak of the first world war he immediately volunteered for service in the British Army and was commissioned in the Royal Artillery in October 1914, serving at the front for almost the whole of the duration of the war, and retiring with the rank of captain and two M.C. awards. He was one of the early members of British Great War Veterans and a life member of the St. George's Society of New York. His protracted service in combat areas seriously affected his health and activities for the rest of his life. On the death of his brother, Mr. C. S. J. Trench, in August 1951 he became President of the *American Metal Market*.

HARRY CLAYTON

We record with regret the death of Mr. Harry Clayton, chairman of the Cementation group of companies, who died on February 4. He had been a director of The Cementation Company Limited for over 30 years. He was also on the board of Whessoe Limited and Imperial and Foreign Corporation Limited and many other companes. Mr. Clayton was chairman of the Hospital Saturday Fund until just before his death, and was also on the St. Helier Group Hospital Management Committee of the Sutton and Cheam Hospital.

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NATIONAL COAL BOARD invite applications for the undermentioned superannuable appointments in the Mechanization Branch of Production Department at London Headquarters.

DEPUTY CHIEF MECHANIZATION ENGINEER—(salary, according to qualifications and experience, but not less than £2,000 per annum). The successful candidate will be required to assist the Chief Mechanization Engineer in the general control and co-ordination of the Branch's work but will also carry the major responsibility within the Branch for the design and development of new machinery and the necessary liaison with the Engineering Branch. Initially the duties will involve working in London, but there is a possibility that at a later stage the occupant of the post may be required to work outside London.

Applicants, who must hold a First Class Certificate of Competency, must have had wide experience of different forms of mechanized coal face operations and be familiar with some of the latest developments in this field in this country and abroad. (Ref. No.: TT/590.)

TWO MECHANIZATION ENGINEERS—(salary, according to qualifications and experience, of not less than £1,500 per annum). The duties will involve the study of mechanized methods of getting coal and ancillary operations at and immediately behind the coal face, stimulating and keeping in touch with trials of new machines in the pits and assisting in the development of new machines and their adaptation to varying conditions. They will involve spending a considerable time in the coalfields visiting the pits and studying conditions underground. The successful candidates will be required to work in London initially but may at a later stage be required to work outside London, though still as members of the Headquarters staff.

Applicants must have had considerable experience of modern mechanized methods of coal mining and the problems associated therewith. A First Class Certificate of Competency is essential. (Ref. No.: TT/591.)

Write, giving full particulars (in chronological order) of age, education, qualifications and experience (with dates) to National Coal Board, Establishments (Personnel), Hobart House, Grosvenor Place, London, S.W.1., marking envelope with the *relevant TT Reference Number quoted above*. Original testimonials should *NOT be forwarded. Closing date 28th February, 1953.*

WANTED — A qualified and experienced Mining Engineer for operating Opencast Iron Ore Mines in Goa, Portuguese India. Preference will be given to one who has administrative experience and who can suggest development plans. Free and furnished accommodation will be given at the mines. Applicants should state their full experiences together with certificates, if any, where they could be interviewed, and net salary expected free of taxes. We undertake to look after the visa formalities and the selected candidate will have to travel immediately by air, passage provided by us. Apply to Chowgule and Co. Ltd., Mining Department, Mormugao Harbour, Goa, Portuguese India.

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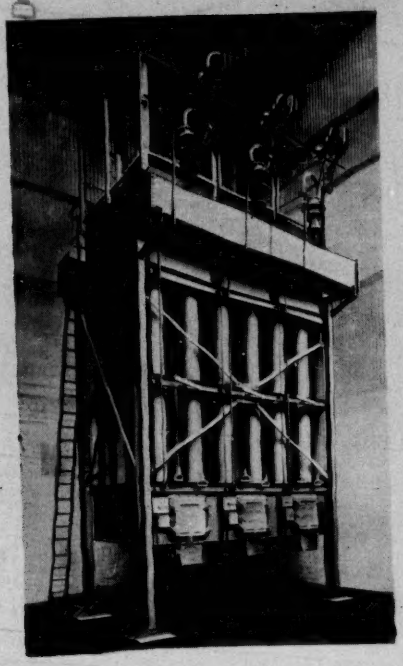

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